BLM LIBRARY
88063891

Upper Missouri River Breaks National Monument

Proposed Resource Management Plan and Final Environmental Impact Statement

VOLUME III

January 2008

BLM

Lewistown Field Office

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BLM LIBRARY
BLDG 50, ST-150A
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based on the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation; rangelands; timber; minerals; watershed; fish and wildlife; wilderness; air; and scenic, scientific, and cultural values.

BLM/MT/PL-08/002+1610

HD
243
.M9
U73
2008
V.3

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

PROPOSED RESOURCE MANAGEMENT PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME III

Lewistown Field Office
Lewistown, Montana

January 2008

BLM LIBRARY
BLDG 50, ST-150A
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225

Contents

Volume III

Bibliography 1237

Glossary 1255

Index 1263

Appendices

A Resource Advisory Council Recommendations, 1999 1265
B Proclamation 7398 of January 17, 2001 1271
C Natural Resources on BLM Land, Upper Missouri River Breaks National Monument 1277
D Governor's Task Force Recommendations 1283
E Scoping Issues 1285
F Issues Considered but Not Analyzed Further 1293
G Vision and Management Goals 1297
H Implementation and Monitoring 1299
I Federal and Montana Ambient Air Quality Standards 1303
J Standards for Rangeland Health and Guidelines for Livestock Grazing Management 1305
K Best Management Practices 1309
L Cultural Resource Use Categories 1317
M Watershed Planning Process 1323
N Grazing Allotments 1325
O Oil and Gas 1329
P Wild and Scenic River Eligibility and Suitability Report 1401
Q Visitor Use Standards and Indicators 1415
R Wildlife 1421
S Soil Survey Geographic (SSURGO) 1433
T Important Vegetation Species Found in Riparian Areas 1451
U Noxious/Invasive Plant Species at Recreation Sites 1453
V Rights-of-Way 1455
W Economic Tables Showing Industry Output, Employment, Income, and Income per Job by North American Industrial Classification System (NAICS) Division for the Five Counties in the Study Area 1457
X U.S. Fish and Wildlife Service Concurrence 1463

Maps

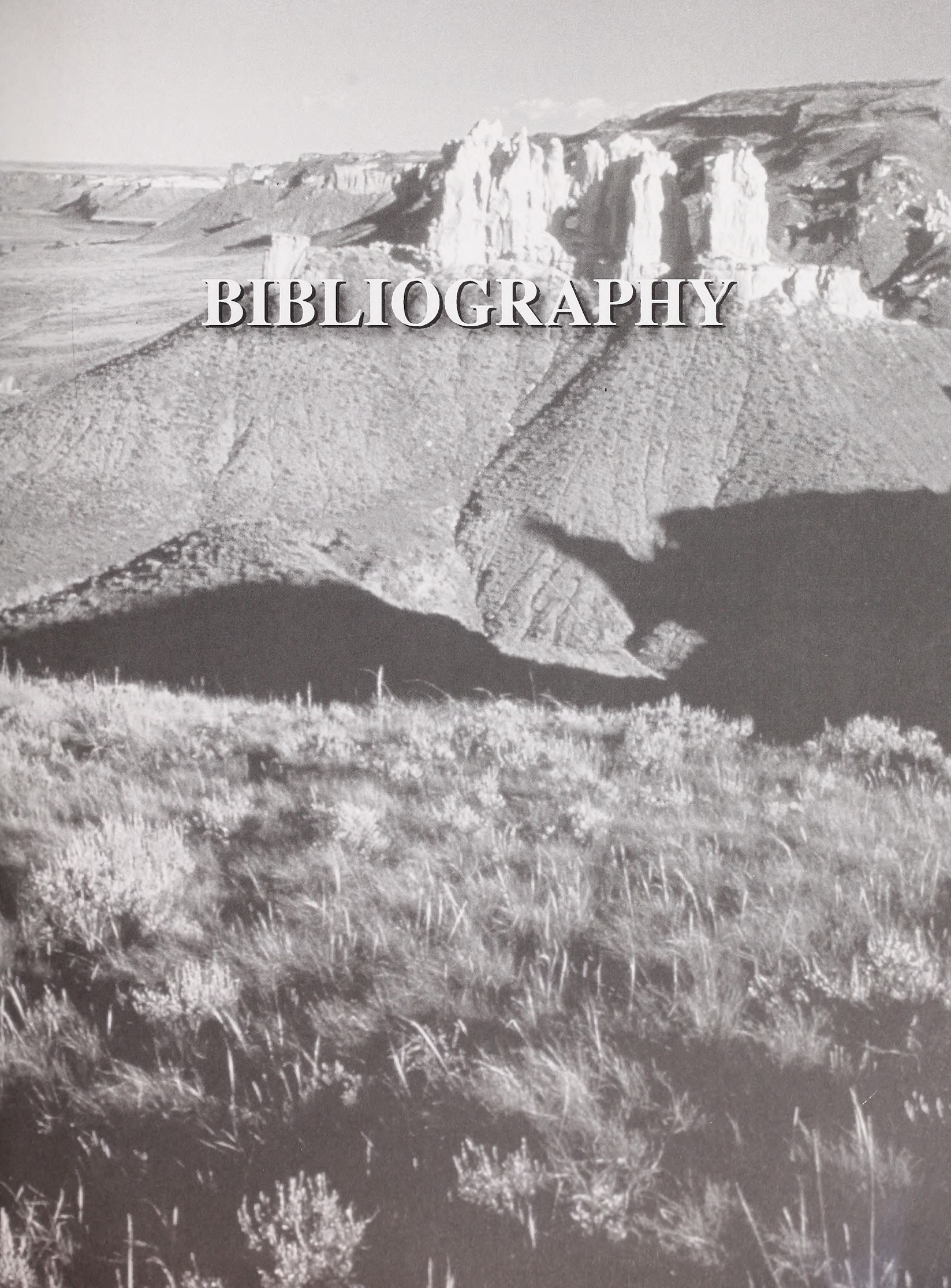
Map 1 Right-of-Way Corridors (Preferred Alternative)
- Side A – West Right-of-Way Corridors
- Side B – East Right-of-Way Corridors

Map 2 Recreation (Preferred Alternative)
- Side A – West Recreation Map
- Side B – East Recreation Map

Map 3 Natural Gas Exploration and Development
- Side A – Oil and Gas
- Side B – Reasonable Foreseeable Development

Map 4 Transportation (Alternative A)
- Side A – West Transportation Map
- Side B – East Transportation Map

Map 5 Transportation (Preferred Alternative)
- Side A – West Transportation Map
- Side B – East Transportation Map



BIBLIOGRAPHY

BIBLIOGRAPHY

Aderhold, M. 1996. Montana's endangered species – a status report. Montana Outdoors March/April 1996. Helena, Montana.

Alaska Department of Natural Resources. 2000. Federal Reserved Water Rights. www.dnr.state.ak.us/mlw/factsht/wtr_fs/fed_rsv.pdf.

Allen, E.O. 1968. Range use, foods, condition, and productivity of white-tailed deer in Montana. Journal of Wildlife Management 32(1):130-141.

Anderson, E., S.C. Forrest, T.W. Clark and L. Richardson. 1986. Paleobiology, biogeography, and systematics of the black-footed ferret, *Mustela nigripes* (Audubon and Bachman), 1851. Great Basin Naturalist Memoirs 8:11-62.

Auble, G.T. and M.L. Scott. 1998. Fluvial disturbance patches and cottonwood recruitment along the upper Missouri River, Montana: Wetlands 18(4):546-556.

Auble, G.T., M. Scott, J. Frazier, C. Krause and M. Merigliano. 2005, Cottonwood in the Missouri Breaks National Monument: Fact Sheet 2005-3132. U.S. Department of the Interior, U.S. Geological Survey, December 2005.

Aune, K. 1991. Increasing mountain lion populations and human-mountain lion interactions in Montana. Pages 86-94 in C.L. Braun, ed. Mountain Lion-Human Interaction Symposium. Colorado Division of Wildlife, Denver. 114 pp.

Balison, Stefani. 2002. Fire history and regeneration patterns of *Pinus ponderosa* in the Missouri River Breaks. Unpublished report on file at Central Fire Zone, Bureau of Land Management, Lewistown, MT.

Baxter, G. and J. Simon. 1970. Wyoming fishers. Bulletin Number 4, Wyoming Game and Fish Department. Cheyenne.

Beck, J.L., D.L. Mitchell. 2000. Influences of livestock grazing on sage grouse habitat. Wildlife Society Bulletin 28(4):993-1002.

Beier, P. 1995. Dispersal of juvenile cougars in fragmented habitat. Journal of Wildlife Management. 59:228-237.

Bekoff, M. 1982. Coyote. Pages 447-459 in J.A. Chapman and G.A. Felkhamer, editors. Wild Mammals of North America, Biology, Management and Economics. John Hopkins University Press, Baltimore, USA and London, England.

Bengston, D., George Xu and David Fan. 2001. Attitudes toward ecosystem management in the United States, 1992-1998. Society and Natural Resources. 14:471-487.

Berg, R. K. 1981. Fish Populations of the Wild and Scenic Missouri River, Montana. Montana Fish Wildlife and Parks. Helena. Restoration Project FW-3-R. Job 1-A. 242 p.

Bleich, V.C., J.D. Wehausen and S.A. Holl. 1990. Desert-dwelling mountain sheep: conservation implications of a naturally fragmented distribution. Conservation Biology. 4:383-390.

Bowen, W.D. 1982. Home range and spatial organization of coyotes in Jasper National Park, Alberta. Journal of Wildlife Management. 46:201-216.

Bramblett, R.G. 1996. Habitats and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri rivers, Montana and North Dakota. Ph.D. dissertation. Montana State University, Bozeman. 210 pp.

Braun, C.E., T.Britt and R.O. Wallestad. 1977. Guidelines for maintenance of sage grouse habitats. Wildlife Society Bulletin 5:99-106.

Brown, C. 1976. Fishes of Montana. Big Sky Books, Montana State University. Bozeman.

Buechner, H.K. 1960. The bighorn sheep in the United States, its past, present and future. Wildlife Monographs 4:174.

Burchfield, Jim and R. Neil Moisey. 2000. Characteristics of the Upper Missouri National Wild and Scenic River: Pathways to Sustain A Common Heritage. School of Forestry, The University of Montana. Missoula.

Bureau of Land Management (BLM). 1977. Lewistown District Office. A Management Plan for the Upper Missouri Wild and Scenic River.

Bureau of Land Management (BLM). 1978. Montana State Office. Upper Missouri Wild and Scenic River Management Plan.

Bureau of Land Management (BLM). 1979. Montana State Office. Final Missouri Breaks Grazing Environmental Statement.

Bureau of Land Management (BLM). 1980. Miles City and Lewistown Districts. Montana Wilderness Inventory.

Bureau of Land Management (BLM). 1982a. Prairie Potholes Environmental Impact Statement.

Bureau of Land Management (BLM). 1982b. Lewistown District. Oil and Gas Environmental Assessment of the BLM Leasing Program.

Bureau of Land Management (BLM). 1983. Environmental Assessment of the Proposed Superior Oil Company #5-1 Gas Well, Teton County, Blackleaf Canyon Federal Unit. Great Falls Resource Area, Bureau of Land Management. Great Falls, MT.

Bureau of Land Management (BLM). 1985. Wild Horse and Burro Act.

Bureau of Land Management (BLM). 1986a. Wetland Policy.

Bureau of Land Management (BLM). 1986b. West HiLine Management Situation Analysis.

Bureau of Land Management (BLM). 1986c. Lewistown District Office. Containment/ Eradication of Selected Noxious Plants in BLM Lewistown District.

Bureau of Land Management (BLM). 1987. Miles City District Office. Missouri Breaks Wilderness Suitability Study/Environmental Impact Statement.

Bureau of Land Management (BLM). 1988. Lewistown District. Final West HiLine Resource Management Plan/Environmental Impact Statement.

Bureau of Land Management (BLM). 1989. Judith-Valley-Phillips (JVP) Management Situation Analysis.

Bureau of Land Management (BLM). 1991a. Lewistown District Office. Rangeland Program Summary Update.

Bureau of Land Management (BLM). 1991b. Vegetation Treatment on BLM Lands in Thirteen Western States, Final Environmental Impact Statement.

Bureau of Land Management (BLM). 1992a. Lewistown District Office. West HiLine Resource Management Plan/Environmental Impact Statement Record of Decision.

Bureau of Land Management (BLM). 1992b. Nongame Migratory Bird Habitat Conservation Plan.

Bureau of Land Management (BLM). 1992c. Upper Missouri National Wild and Scenic River Cultural Resource Management Plan.

Bureau of Land Management (BLM). 1993. Lewistown District Office. Upper Missouri National Wild and Scenic River Management Plan Update.

Bureau of Land Management (BLM). 1994a. Lewistown District Office. Judith-Valley-Phillips (JVP) Resource Management Plan.

Bureau of Land Management (BLM). 1994b. Lewistown District Office. Wild and Scenic River Evaluation (Ch. 2, p. 17).

Bureau of Land Management (BLM). 1997. Montana State Office. Montana/Dakotas Standards for Rangeland Health and Guidelines for Livestock Grazing Management, Environmental Impact Statement.

Bureau of Land Management (BLM). 1998a. Lewistown Field Office. Two Calf Watershed Management Plan and Environmental Assessment.

Bureau of Land Management (BLM). 1998b. Lewistown District. Woodhawk Watershed Interdisciplinary Management Plan.

Bureau of Land Management (BLM). 1998c. Missouri River Manors: An Overview of Homesteads and Historic Structures along the Upper Missouri Wild and Scenic River.

Bureau of Land Management (BLM). 1999. Montana State Office. Briefing statement on proposed national designation.

Bureau of Land Management (BLM). 2000a. Frequently Asked Questions, downloaded from the BLM website, http://www.blm.gov/nhp/faqs/.

Bureau of Land Management (BLM). 2000b. Landcatcode Definitions, downloaded from the BLM website, http://www.blm.gov/nhp/efoia/or/fy2001/ib/b2001-062.htm.

Bureau of Land Management (BLM). 2000c. Lewistown Field Office. Lower Crooked Creek Watershed Plan and Environmental Assessment.

Bureau of Land Management (BLM). 2000d. Lewistown Field Office. Armells Creek (Breaks Portion) Watershed Environmental Assessment.

Bureau of Land Management (BLM). 2001a. Montana State Office. State Director's Interim Guidance for Managing the Upper Missouri River Breaks National Monument.

Bureau of Land Management (BLM). 2001b. Upper Missouri River Breaks National Monument. Guidelines for Integrated Weed Management.

Bureau of Land Management (BLM). 2001c. Malta Field Office. Beauchamp Watershed Plan.

Bureau of Land Management (BLM). 2002a. Lewistown Field Office. Upper Missouri River Breaks National Monument Resource Management Plan Scoping Report.

Bureau of Land Management (BLM). 2002b. Lewistown Field Office. Upper Missouri River Breaks National Monument Resource Management Plan Scoping Comment Summary.

Bureau of Land Management (BLM). 2002c. Lewistown Field Office. Preparation Plan for the Upper Missouri River Breaks National Monument Resource Management Plan.

Bureau of Land Management (BLM). 2002d. Great Falls Oil & Gas Field Station. Macum Energy Inc., Klabzuba Oil and Gas Inc., Ocean Energy Resources Inc. Natural Gas Project Environmental Assessment.

Bureau of Land Management (BLM). 2002e. Final Environmental Impact Statement for oil and gas development on the Southern Ute Indian Reservation, in La Plata and Archuleta Counties, Colorado.

Bureau of Land Management (BLM). 2002f. Memorandum of Understanding with Montana Department of Environmental Quality to protect and restore water quality on public lands managed by the Bureau of Land Management in Montana.

Bureau of Land Management (BLM). 2002g. Lewistown Field Office. Upper Missouri Watershed Management Plan Environmental Assessment.

Bureau of Land Management (BLM). 2002h. Havre Field Station. Loma/Vimy Ridge Watershed Environmental Assessment & Plan Amendment.

Bureau of Land Management (BLM). 2002i. Instruction Memorandum No. 2002-164.

Bureau of Land Management (BLM). 2002j. Instruction Memorandum No. 2002-167.

Bureau of Land Management (BLM). 2002k. Landusky/Zortman Town Sites Hazard Fuel Reduction Project EA (MT-090-02-03).

Bureau of Land Management (BLM). 2002l. Geophysical Exploration Permit (MT-090-02-09).

Bureau of Land Management (BLM). 2002m. Interpreting Indicators of Rangeland Health. Technical Reference 1734-6.

Bureau of Land Management (BLM). 2003a. Lewistown Field Office. GIS Analysis, July 2003, Project File 1616.071, Lewistown, MT.

Bureau of Land Management (BLM). 2003b. Lewistown Field Office. Upper Missouri River Breaks National Monument Analysis of the Management Situation.

Bureau of Land Management (BLM). 2003c. Payment in Lieu of Taxes (PILT) Regulations, downloaded from the Department of the Interior website, http://www.doi.gov/pilt/regulations.html.

Bureau of Land Management (BLM). 2003d. Best Management Practices for Fluid Minerals, Wildlife managements. http://www.blm.gov/style/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/bmps.Par.74198.File.dat/WO1_WildlifeMgmt_BMPs_Slideshow.pdf.

Bureau of Land Management (BLM). 2003e. Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas. Billings, Montana.

Bureau of Land Management (BLM). 2003f. Rangeland Management, Current Rates, Grazing, downloaded from the Bureau of Land Management website, ww.nv.blm.gov/range/Current_Rates.htm, November 24, 2003.

Bureau of Land Management (BLM). 2003g. Farmington Field Office. Farmington Resource Management Plan with Record of Decision.

Bureau of Land Management (BLM). 2003h. LR2000 Lands and Records Database.

Bureau of Land Management (BLM). 2003i. The BLM's Priorities for Recreation and Visitor Services.

Bureau of Land Management (BLM). 2003j. Payments in Lieu of Taxes, downloaded from the Department of the Interior website, http://www.doi.gov/pilt/summary.html.

Bureau of Land Management (BLM). 2004. Lewistown Field Office. Upper Missouri River Breaks National Monument Resource Management Plan Alternative Development Comment Summary.

Bureau of Land Management (BLM). 2005. Lewistown Field Office. Upper Missouri River Breaks National Monument Oil and Gas Leases Scoping Report.

Bureau of Land Management (BLM). 2007. Lewistown Field Office. Land Mineral Records (LR2000).

Calhoun, Fred, H.H. 1906. The Montana Lobe of the Keewatin Ice Sheet. U.S. Geological Survey Professional Paper No. 59.

Canfield, J.E., L.J. Lyon, J.M. Hillis and M.J. Thompson. 1999. Ungulates. Pages 6.1-6.25 in G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife. Montana Chapter of The Wildlife Society. 307 pp.

Carey, C. 1993. Hypothesis concerning the causes of the disappearance of boreal toads from the mountains of Colorado. Cons. Biol. 7:355-362.

Carlson, D.M., W.L. Pflieger, L. Trial and P.S. Haverland. 1985. Distribution, biology, and hybridization of *Scaphirhynchus albus* and *S. platorynchus* in the Missouri and Mississippi Rivers. Environmental Biology of Fishes 14(1): 51-59.

Central Montana Resource Advisory Council (RAC). 1999a. Meeting Minutes for August 10, 1999.

Central Montana Resource Advisory Council (RAC). 1999b. Meeting Minutes for October 28-29, 1999.

Central Montana Resource Advisory Council (RAC). 1999c. Meeting Minutes for November 16 and 17, 1999.

Central Montana Resource Advisory Council (RAC). 1999d. Report to the Secretary on the Upper Missouri River and Breaks Area. December.

Central Montana Resource Advisory Council (RAC). 2002a. Meeting Minutes for January 29-30, 2002.

Central Montana Resource Advisory Council (RAC). 2002b. Meeting Minutes for March 8, 2002.

Central Montana Resource Advisory Council (RAC). 2003. Upper Missouri River RAC Subgroup Report to the Central Montana RAC.

Chinook, Montana Comprehensive Plan Elements. 1979. Chinook-Blaine County Comprehensive Plan.

Chouteau County Growth Policy Plan. 1994.

Christiansen, C.C. 1975. Organochlorine pesticide and polychlorinated biphenyl contamination of the channel catfish (*Ictalurus punctatus*) of the Missouri River. Nebraska Department of Environmental Control, Lincoln.

City of Fort Benton. 2002. Needs Assessment Survey Final Report.

Cole, G.F. 1956. The pronghorn antelope – Its range use and food habits in central Montana with special reference to wheat. Montana fish and Game Department, Montana Agriculture Experiment Station, Technical Bulletin No. 516:1-63.

Connelly, J.W., M.A. Schroeder, A.R. Sands, C.E. Braun 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28(4): 967-985.

Conte, F.S., S.I. Doroshov, P.B. Lutes and E.M. Strange. 1988. Hatchery manual for the white sturgeon with applications to the North American Acipenseridae. Publication 3322, University of California, Davis. 104 pp.

Cordell, H. Ken, C. Betz, J.M. Bowker, D. English, H. Shela, J.C. Bergstrom, R.J. Teasley, M.A. Tarrant, J. Loomis. 1999. Outdoor recreation in American life: a national assessment of demand and supply trends. Champaign, IL: Sagamore Publishing. xii, 449 p.

Cross, F. 1967. Handbook of fishes of Kansas. Museum of Natural History, University of Kansas. Lawrence, Kansas.

Deaver, S. 1986. American Religious Freedom Act (AIRFA) Background Data. Report prepared by Ethnoscience for the BLM Montana State Office, Billings, Montana.

Dillion, Thale. 2000. "Employment and Wages: The Travel Industry in Montana." University Travel Research Program, University of Montana. Technical Report 2000-1. July.

Dinsmore, S.J. 2000. Mountain Plover, pages 213-218. *In* R.P. Reading and B. Miller [eds.], Endangered animals: a reference guide to conflicting issues. Greenwood Press, Westport, CT.

Dinsmore, S.J. 2001. Dissertation. Population biology of mountain plovers in southern Phillips County, Montana. Colorado State University. Fort Collins, Colorado. 99 pp.

Dryer, M.P. and A.J. Sandvol. 1993. Recovery plan for the pallid sturgeon (*Scaphirhynchus albus*). U.S. Fish and Wildlife Service. Bismarck, ND. 55 pp.

Dunn, W.C. 1996. Evaluation bighorn habitat: A landscape approach. Technical note 395. New Mexico Dept. Game and Fish. 41 pp.

Dwights/Powertools Oil and Gas Datatbase. October 2002.

Eichhorn, L.C., C.R. Watts. 1972. Bighorns in the breaks. Montana Outdoors. 3(3)32-34.

Eigell, Robert. 1987. *Cows, Cowboys, Canners, and Corned Beef and Cabbage*. Vantage Press Inc., New York.

Eisenhauer, Brian W., R. Krannich and D. Blahna. Attachments to Special Places on Public Lands: An analysis of Activities, Reasons for Attachments, and Community Connections. Society & Natural Resources 13:421-441. 2000.

Elser, A. A., R. C. McFarland and D. Schwehr. 1977. The effects of altered streamflow on fish of the Yellowstone and Tongue Rivers, Montana. Yellowstone Impact Study Technical Report No. 8. Water Resources Division Montana Department of Natural Resources and Conservation. Helena, Montana.

Elser, A. A., M.W. Gorges and L. M. Morris. 1980. Distribution of fishes in southeastern Montana. Report submitted to the Bureau of Land Management. Miles City.

Erdman, C.E. and Lemke, R.W. 1963. Geology and Mineral Resources of Missouri River Valley between Head of Fort Peck Reservoir and Morony Dam, Appendix III of U.S. Army Corps of Engineers, Department of Interior and U. S. Bureau of Reclamation. Joint report on water and related land resources development of Missouri River Fort Peck Reservoir to Vicinity of Fort Benton, Montana: Government Printing Office, Washington D.C.

Federal Register. 1994. Changes in hydric soils of the United States. Washington, DC (current Hydric Soil definition).

Federal Register: Volume 65, No. 86, 2000, Restriction of Public Lands.

Federal Register Online, www.wais.access.gpo.gov, November 23, 2003.

Fergus County. 1987. Heartland Montana Economic Development Plan: 1987-1992 for Lewistown/ Fergus County.

Fergus County Land Use Policy. 1992. Adopted August 17.

Forrest, S.C., T.W. Clark, L. Richardson and T.M. Campbell III. 1985. Black-footed ferret habitat: some management and reintroduction considerations. Wyoming Bureau of Land Management, Wildlife Technical Bulletin, No. 2. 49 pp.

Funk, J.L. and J.W. Robinson. 1974. Changes in the channel of the lower Missouri River and effects on fish and wildlife. Missouri Department of Conservation, Aquatic Series 11, Jefferson City.

Gardner, W. M. and R. Berg. 1982. An analysis of the instream flow requirements for selected fishes in the wild and scenic portion of the Missouri River. Montana Fish, Wildlife and Parks. Helena. 111 pp.

Gardner, W.M. and P.A. Stewart. 1987. The fishery of the lower Missouri River, Montana. Montana Fish, Wildlife and Parks. Restoration Project FW-2-R. Job 1-b. 223 pp.

Gardner, W.M. 1995. Northcentral Montana Fisheries Study, Missouri River pallid sturgeon inventory. Mont. Fish Wildlife and Parks. Helena. Fed. Aid to Fish and Wildlife Rest. Proj. F-46-R-8. Study No. III, Job D. 13 pp.

Gardner, W.M. 2000. Upper Missouri River pallid sturgeon recovery studies - 2000 progress report. Montana Fish Wildlife and Parks. 12 pp.

Gardner, W.M. 2002. Fisheries biologist, Montana Fish, Wildlife & Parks. Lewistown, MT. Personal communication. February.

Garrett, M.G. and W.L. Franklin. 1988. Behavioral ecology of dispersal in the black-tailed prairie dog. Journal of Mammalogy 29(2): 236-250.

Geist, V. 1971. Mountain sheep, a study in behavior and evolution. Univ. Chicago Press. Chicago. 383 pp.

Geist. V. 1978. Behavior. Big Game of North America; ecology and management. Stackpole Books, Harrisburg, Pennsylvania.

Gentner, Bradley J. and J.A. Tanaka. 2002. Classifying federal public land grazing permittees. Journal of Range Management 55:2-11. January.

Geraldine Historical Society. 1976. *Spokes, Spurs and Cockleburs*. Fort Benton, MT. River Press Publishing. 309 p.

Gese, E.M., O.J. Rongstad and W.R. Mytton. 1988a. Relationship between coyote group size and diet in southeastern Colorado. Journal of Wildlife Management. 52:647-653.

Gese, E.M., O.J. Rongstad and W.R. Mytton. 1988b. Home range and habitat use of coyotes in southeastern Colorado. Journal of Wildlife Management. 52:640-646.

Gese, E.M., O.J. Rongstad and W.R. Mytton. 1989. Population dynamics of coyotes in southeastern Colorado. Journal of Wildlife Management. 53:174-181.

Giddings, B. 1995. Statewide furbearer program annual management and harvest report, 1993-1994, Montana. Montana Department of Fish, Wildlife and Parks, Helena. 51 pp.

Gilbraith, D.M., M.J. Schwalbach and C.R. Berry. 1988. Preliminary report on the status of the pallid sturgeon, *Scaphirhynchus albus*, a candidate endangered species. Department of Wildlife and Fisheries Sciences, South Dakota State University, Brookings, South Dakota.

Gilge Kent. Fisheries Biologist, Montana Fish, Wildlife & Parks (Retired). 2004. Personal communication about impacts, specifically in regard to paddlefish and pallid sturgeon.

Gould, W.R. 1981. First records of the rainbow smelt (Osmeridae), sicklefin chub (Cyprinidae) and white bass (Percichthyidae) from Montana. Proc. Mont. Acad. Sci. 40: 9-10.

Gould, W.R. 1994. The recent distribution of sturgeon chub (*Macrhybopsis gelida*) in Montana. Report to the Montana Department of Fish, Wildlife and Parks. Helena.

Gramann, J. 1999. The Effect of Mechanical Noise and Natural Sound on Visitor Experiences in Units of the National Park Service *Social Science Research Review*. Vol. 1 No. 1 Winter 1999.

Grinnell, G.B. 1904. American big game in its haunts. New York: Forest and Stream Publishing Co. 497 pp.

Grisak, G. G. 1996. The status and distribution of the sicklefin chub in the middle Missouri River, Montana. Masters thesis. Montana State University, Bozeman.

Hall, Frank. California Fish & Game. Personal communication. 2002.

Hamlin, K.L. 1997. Survival and home range fidelity of coyotes in Montana: implications for control. Intermountain Journal of Science 3(2/3):62-72.

Hansen, P. L., S. Chadde and R. Pfister. 1988. Riparian Dominance Types of Montana: Miscellaneous Publication No. 49. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula.

Hansen, Paul L. 1989. Inventory, Classification, and Management of Riparian Sites Along the Upper Missouri National Wild and Scenic River. Final Report to the Montana Riparian Association, School of Forestry, University of Montana. Missoula.

Harmata, A.R. 1984. Bald eagles of the San Luis Valley, Colorado: Their winter ecology and spring migration. PhD. Diss. Montana State Univ., Bozeman. 222 pp.

Hartig, Terry, M. Mang and G. Evans. 1991. Restorative Effects of Natural Environment Experiences. Environment and Behavior. Vol. 23 #1 pp. 3-26.

Hearn Jr., B.C. 1979. Preliminary map of diatremes and alkalic ultramafic intrusions in the Missouri River Breaks and vicinity, north-central Montana: U.S. Geological Survey Open-File Report. 79-1182, scale 1:125,000.

Hearn Jr., B.C. 1989. Alkalic ultramafic magmas in north-central Montana, USA: Genetic connections of alonite, kimberlite, and carbonatite, in Kimberlites and Related Rocks - Volume 1: Their Composition, Occurrence, Origin, and Emplacement, Geol. Soc. Australia, Spec. Publ. 14, pp. 109-119.

Helms, D. 1974. Shovelnose sturgeon, *Scaphirhynchus platorynchus,* in the navigational impoundments of the upper Mississippi River. Tech. Series. Iowa State Conservation Commission 74-3. 68 pp.

Henderson, F.R., P.F. Springer and R. Adrian. 1969. The black-footed ferret in South Dakota. South Dakota Department of Game, Fish and Parks, Tech. Bull. 4:1-36.

Holloran, Mathew J. 2005. Greater Sage-Grouse (Centrocercus urophasianus) Population Response to Natural Gas Field Development in Western Wyoming. Ph. D. Dissertation, University of Wyoming.

Holton, G.D. 1980. The riddle of existence; fishes of special concern. Montana Outdoors 11: 2-6.

Holton, G.D. and H.E. Johnson. 1996. A field guide to Montana fishes (second edition). Montana Fish, Wildlife & Parks. Helena, Montana. 103 pp.

Hoogland, J.L. 1995. The black-tailed prairie dog. University of Chicago Press. Chicago, Illinois. 557 pp.

Hunt, John. 1992. "Rural Tourism: Vital to the New Economy of the New West." Presented as the keynote address for "Transportation: The Vital Link

in the New Economy," A Center of the New West Conference, Denver CO.

Hunter, C. 1994. Species of special concern list, updated. Montana Outdoors. September/October. Helena.

Hunter, Chris. 1997. Montana Outdoors. November/December. MT Fish Wildlife and Parks. Helena, MT.

Ingelfinger, Franz M. 2001. The effects of Natural Gas Development on Sagebrush Steppe Passerines in Sublette County, WY. Masters Thesis, University of Wyoming. 109 pp.

IPCC, 2007: Summary for Policymakers. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Issues & Answers Network, Inc. 2000. Lewis & Clark National Estimation and Awareness Study, Research Report 76.

Jackson, Scott D. 2000. Overview of Transportation impacts on Wildlife movement and Populations. Department of Natural Resources Conservation, University of Massachusetts, Amherst. 14 pp.

Jalkotzy, M.G., P.I. Ross and M.D. Nasserden. 1997. The Effects of Linear Development on Wildlife: A Review of Selected Scientific Literature. Prepared for Canadian Association of Petroleum Producers.

Joslin, G. and H. Youmans. Coordinators. 1999. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society. 307 pp.

Kallemeyn, L. 1983. Status of the pallid sturgeon, *Scaphirhynchus albus*. Fisheries, Vol. 8, No. 1, pp. 3-9.

Kamps, G.F. 1969. White-tailed and mule deer relationships in the Snowy Mountains of central Montana. Bozeman, Montana: M.S. Thesis, Montana State University. 59 pp.

Kay, Charles E. 1994. Aboriginal Overkill: The role of Native Americans in Structuring Western Ecosystems. *Human Nature*, 5(4): 359-398.

Keenlyne, K.D. and L.G. Jenkins. 1993. Age at sexual maturity of the pallid sturgeon. Transactions of the American Fisheries Society. 122:393-396.

Knight, J. 1997. Managing Montana Farm Habitat for Pheasants. Montana State University Extension Service, Bozeman, Montana.

Knowles, C.J., C.J. Stoner and S.P. Gieb. 1982. Selective use of black-tailed prairie dog towns by mountain plovers. Condor 84:71-74.

Knowles, C.J. and P.R. Knowles. 1984. Additional records of mountain plovers using prairie dog towns in Montana. Prairie Naturalist 16:183-186.

Knowles, C.J. and P.R. Knowles. 1998. The historic and current status of the mountain plover in Montana. Bureau of Land Management. Billings, Montana. 43 pp.

Knowles, C.J. and P.R. Knowles. 2001. The 2000 Mountain Plover Survey Results. Bureau of Land Management, Billings, Montana. 31 pp. with appendix.

Knudson, Ruthann. 1992. Upper Missouri National Wild and Scenic River Cultural Resource management Plan. Volume I Overview and Plan. Prepared for BLM, MSO, Cultural Resources Series No. 3.

Koch, R., R. Curry and M. Weber. 1977. The effect of altered streamflow on the hydrology and geomorphology of the Yellowstone River basin, Montana. Yellowstone impact study, technical report 2. Montana Department of Natural Resources and Conservation. Helena. 163 pp.

Koch, E.D. and C.R. Peterson. 1995. The amphibians and reptiles of Yellowstone and Grand Teton National Parks. University of Utah Press. Salt Lake City. 188 pp.

Krentz, S. 1996. Character index for pallid sturgeon and shovelnose sturgeon. Bismarck, North Dakota. U.S. Fish and Wildlife Service 1:96. 1 p.

Kudray, G., P. Hendricks, E. Crowe and S. Cooper. 2004. Riparian Forests of the Wild and Scenic Missouri River: Ecology and Management. Report to the Lewistown Field Office, Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 29 pp. + appendices.

Kynard, B., E. Henyey and M. Horgan 1998. Studies on pallid sturgeon: Turner Falls, Massachusetts: U.S. Geological Survey, Biological Resources Division, Conte Anadromous Fish Research Center.

Lee, David S., C. Gilbert, C. Hocutt, R. Jenkins, D. McAllister and J. Stauffer. 1980. Atlas of North American freshwater fishes. North Carolina State Museum of Natural History. Raleigh.

Lewis, David and A.J. Plantinga. 2000. "Public Conservation Lands and Economic Growth in the Northern Forest Region," Department of Resource Economics and Policy, University of Maine, Orono, Maine.

Liebelt, J.E. 1996. Lower Missouri River and Yellowstone River pallid sturgeon study, 1994-1995. Montana Department of Fish, Wildlife and Parks. Helena.

Liles, K.J. and H. Heystek. 1977. The Bureau of Mines test program for clay and ceramic raw materials, U. S. Bureau of Mines Information Circular 8729.

Lind, Amy J. 1996. USDA Forest Service, Pacific Southwest Research Station, Redwood Sciences Lab presentation to Western Regional Urban Streams Conference, Arcata, California, November 15-17.

Lorah, Paul. 2000. Population Growth, Economic Security, and Cultural Change in Wilderness Counties, In Cole, David N. et al, Wilderness Science in a Time of Change Conference, RMRS-P-15_CD, Fort Collins, Co: US Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Lovaas, A.L. 1957. Mule deer food habits and range use in the Little Belt Mountains, Montana. Journal of Wildlife Management 22(3):3113-320.

Lustig, Thomas D., March. 2003. Where Would You Like the Holes Drilled into Your Crucial Winter Range? Transactions of the 67th North American Wildlife and Natural Resources Conference.

Lyden, C.J. 1948. The gold placers of Montana: Montana Bureau of Mines and Geology Memoir No. 26, 152 p.

Lyon, Jack L. 1979. Habitat Effectiveness for Elk as Influenced By Roads and Cover. Journal of Forestry. October.

Mac, M. J., P. A. Opler, C. E. Puckett Haecker and P. D. Doran. 1998. Status and trends of the nation's biological resources 2:437-964. United States Department of the Interior, Geological Survey, Reston, Virginia.

Mackie, R.J. 1965. Range ecology and relations of mule deer, elk and cattle in the Missouri River Breaks, Montana. Wildlife monograph No. 20. 79 pp.

Mackie, R.J., R.F. Batchelor, M.D. Majerus, J.P. Weigand and V.P. Sundberg. 1998a. Habitat Management Suggestions for Selected Wildlife Species. Montana State University Extension Service, Bozeman, Montana.

Mackie, R.J., D.E. Pac, K.L. Hamlin, and G.L. Dusek. 1998b. Ecology and Management of Mule Deer and White-tailed Deer in Montana. Montana Fish, Wildlife and Parks. Helena, Montana.

Magaddino, R. 1989. Living with bald eagles. Montana Outdoors. Montana Fish, Wildlife and Parks. Helena, Montana.

Maxell, B.A. 2000. Management of Montana's amphibians: a review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history, and the status and conservation of individual species. Report to USFS Region 1, Order Number 43-0343-0-0224. University of Montana, Wildlife Biol. Prog., Missoula. 161 pp.

McMahon, Kim. 2001. Montana Lewis and Clark Sites Characteristics of Visitors, Summer 2000.

Miller, B., R.P. Reading and S. Forrest. 1996. Prairie night: black-footed ferrets and the recovery of endangered species. Smithsonian Institution Press. Washington and London. 254 pp.

Minerals Management Service. 2000. State Mineral Summaries, Fiscal Year 2000, Minerals Revenue Management, U.S. Department of the Interior, quoted from Section 35 of the Mineral Leasing Act of 1920, 30 U.S.C. 191.

Minerals Management Service. 2000. State Mineral Summaries, Fiscal Year 2000, U.S. Department of the Interior.

Minerals Management Service. 2003. About the Minerals Management Service, downloaded from the Mineral Management Service website, http://www.mms.gov/aboutmms/.

Minerals Management Service. 2003. Federal Oil Valuation, Proposed Rule, Federal Register, Volume 68, No. 161, Washington D.C.

Minnesota IMPLAN Group, Inc. 2000 IMPLAN data, with modifications by NEA.

Monahan, Glenn and C. C. Biggs. 1997. *Montana's Wild & Scenic Upper Missouri River*. Northern Rocky Mountain Books, Anaconda, Montana.

Montana Aquatic Nuisance Species (ANS) Steering Committee. 2002. Montana Aquatic Nuisance Species (ANS) Management Plan, Final.

Montana Bald Eagle Working Group. 1986. Montana Bald Eagle Management Plan. Bureau of Land Management. Billings, MT.

Montana Bald Eagle Working Group. 1994. Montana Bald Eagle Management Plan. 2nd ed. Bureau of Land Management. Billings, MT. 104 pp.

Montana Board of Oil and Gas Conservation (MBOGC). 1989. Draft Programmatic Environmental Impact Statement on Oil and Gas Drilling & Production in Montana. p. 106, Dust Mitigation.

Montana Code Annotated (MCA). 1999. 15-36-324 (Temporary Distribution of Taxes, Helena, Montana, downloaded from the Montana State website, http://data.opi.state.mt.us.bills/1999/mca/15/36/15-36-324.htm.

Montana Code Annotated (MCA). 2003. 15-36-332, Distribution of taxes to taxing units—appropriation, Helena, Montana, downloaded from the Montana State website, http://data.opi.state.mt.us/bills/2003/mca/15/36/15-36-332.htm.

Montana Code Annotated (MCA). 2003. 15-70-10, downloaded from State of Montana website, http://data.opi.state.mt.us/bills/mca/15/70/15-70-101.htm.

Montana Code Annotated (MCA). 2003. 20-9-331, Basic county tax for elementary equalization and other revenue for county equalization of elementary BASE funding program, Helena, Montana, downloaded from the Montana State website, http://data.opi.state.mt.us/bills/2003/mca/20/9/20-9-331.htm.

Montana Code Annotated (MCA). 2003. 20-9-333, Basic county tax for elementary equalization and other revenue for county equalization of elementary BASE funding program, Helena, Montana, downloaded from the Montana State website, http://data.opi.state.mt.us/bills/2003/mca/20/9/20-9-333.htm.

Montana Department of Environmental Quality. 2004. 305(b)/303(d) Water Quality Assessment Database, http://www.deq.mt.gov/CWAIC/default/aspx.

Montana Department of Revenue. 2003. Distribution of Oil and Gas Production Tax, downloaded from the Montana State website, http://discoveringmontana.com/revenue/css/3forbusinesses/.

Montana Department of Revenue. 2003. Oil and Natural Gas Production Taxes, downloaded from the Department of Revenue website, http://discoveringmontana.com/revenue/.

Montana Fish, Wildlife and Parks (MFWP). 1996. Final Environmental Impact Statement: management of mountain lions in Montana. Helena. 138 pp.

Montana Fish, Wildlife and Parks (MFWP). 2005. Personal communications with Rosgaard, Sullivan and Stivers, MFWP biologists.

Montana Natural Heritage Program (MNHP). 2002. Species information: blue sucker, paddlefish, sturgeon chub, pallid sturgeon. Downloaded from Internet February 2002. Helena, Montana.

Montana Office of the Governor. 2001. Report to Secretary of Interior, Recommendations of the Governor's Task Force Upper Missouri River Breaks National Monument.

Montana Office of the Governor. 2001a. Report to Secretary of Interior Honorable Gale Norton, Recommendations of the Governor's Task Force, Upper Missouri River Breaks National Monument. August.

Montana Oil and Gas Annual Review. 1999. Volume 43.

Montana Prairie Dog Working Group. 2002. Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana.

Montana Sage Grouse Work Group. 2005. Management Plan and Conservation Strategies for Sage Grouse in Montana - Final.

Montana Weed Management Plan. 2001. Montana Department of Agriculture. Montana Weed Control Association.

Montana Weed Management Plan (Updated). 2005. Montana Department of Agriculture. Montana Weed Control Association.

Moss, R.E. 1978. Movement and reproduction of shovelnose sturgeon, *Scaphirynchus platorynchus*, in the Missouri River, South Dakota. Doctorate Dissertation, University of South Dakota, Vermillion, South Dakota. 216 pp.

Moss, R. E., J. W. Scanlan and C. S. Anderson. 1983. Observations on the natural history of the blue sucker (*Cycleptus elongatus* LeSueur) in the Neosho River. The American Midland Naturalist 109(1):15-22.

Moyle, P.B. and J.J. Cech. 1982. Fishes: An introduction to ichthyology. Prentice-Hall, Englewood Cliffs, New Jersey.

Moynahan, B. University of Montana. 2004. Unpublished study re: sage-grouse nesting.

Moynahan, B. University of Montana. 2005. Personal communication. June 23.

Murphy, K.M. 1983. The ecology of the cougar (*Puma concolor*) in the northern Yellowstone ecosystem: interactions with prey, bears, and humans. Ph.D. Dissertation. University of Idaho, Moscow. 147 pp.

National Invasive Species Council (NISC). 2001. Meeting the Invasive Species Challenge: National Invasive Species Management Plan. 80 pp.

National Soil Survey Handbook, title 430-VI. U.S. Department of Agriculture, Natural Resources Conservation Service. 2003. [Online] Available: http://soils.usda.gov/technical/handbook/.

Natural Resources Conservation Service technical guide, April 1984.

Niccolucci, M. U.S. Forest Service, Missoula, Montana. 2003. Personal communication. September 12.

Nicholson, Joel, Alberta Fish & Wildlife. Personal communication. 2000.

Nielson, L.S. 1978. The effects of rest-rotation grazing on the distribution of sharp-tailed grouse. Bozeman, Montana: M.S. Thesis, Montana State University. 52 pp.

O'Gara, Bart W. and J.D. Yoakum. 1992. Pronghorn Management Guidelines. U.S. Fish and Wildlife Service.

Olson, S.L. 1985. Mountain plover food items on and adjacent to a prairie dog town. Prairie Naturalist 17:83-90.

Olson, S.L. and D. Edge. 1985. Nest site selection by mountain plovers in north central Montana. Journal of Range Management 38:280-282.

Olson-Edge, S.L. and W.D. Edge. 1987. Density and distribution of the mountain plover on the Charles M. Russell National Wildlife Refuge. Prairie Naturalist 19:233-238.

Patterson, R.L. 1952. The Sage Grouse in Wyoming. Wyoming Game and Fish Commission, and Sage Books, Inc., Denver, CO. 341 pp.

Perry, E.S., 1962. Montana in the Geologic Past: Montana Bureau of Mines and Geology Bulletin 26.

Pflieger, W. 1975. The fishes of Missouri. Missouri Department of Conservation. Jefferson City, Missouri.

Phillips, Spencer. 2000. Windfalls for wilderness: land protection and land value in the Green Mountains, in: McCool, Stephen F.; Cole, David N.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Wilderness science in a time of change conference—Volume 2: Wilderness within the context of larger systems, proceedings RMRS-P-15-VOL-2, Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, p. 258-267.

Reeves, Frank. 1953. Bearpaw Thrust-Faulted Area, Billings Geologic Society Guidebook 4th annual field conference. P. 114-117.

Reichel, J.D. and D.L. Flath. 1995. Identification guide to the amphibians and reptiles of Montana. Montana Outdoors 26:15-34.

Rocky Mountain Oil Journal. 2003. Volume 83 No. 02.

Roper Starch Worldwide. May 2001. Lessons from the Environment: The Ninth Annual National Report Card on Environmental Attitudes, Knowledge, and Behavior.

Rost, Gregory R. and J.A. Bailey. 1979. Distribution of Mule Deer and Elk in Relation to Roads. Journal of Wildlife Management. 43.

Rouse, R.A. 1957. Elk food habits, range use and movement, Gravelly Mountains, Montana. Bozeman, Montana: M.S. Thesis, Montana State College, 29 pp.

Rowley, Arthur E., Montana Geological Society. 1984. Leroy Field Report.

Ruebelmann, George. 1983. *Archaeology in Montana.* Vol. 24, No. 3.

Ryce, E., Montana Fish, Wildlife & Parks, Helena, Montana. 2007. Personal Communication, February 22 and 26.

Ryder, T.J. and L.L. Irwin. 1987. Winter Habitat Relationships of Pronghorns in South Central Wyoming. Journal of Wildlife Management, 51.

Schempf. P.F. 1997. Bald eagle longevity record from southeastern Alaska. J. Field Ornithology: 68:1:150-151.

Schmidt, Kirsten M., J.P. Menakis, C.C. Hardy, W.J. Hann, D.L. Bunnell. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 41 p. + CD.

Science 25 July 2003: Vol. 301. no. 5632, pp. 458 – 459. DOI: 10.1126/science.301.5632.458b

Scott, M.L. and G. T. Auble. 2002. Conservation and restoration of semi-arid riparian forests: a case study from the Upper Missouri River, Montana, USA, in Middleton, B., ed., Flood pulsing and wetland restoration in North America: John Wiley and Sons, Inc., p. 145-190.

Scott, M.L., S.K. Skagen and M.F. Merigliano. 2003. Relating geomorphic change and grazing to avian communities in riparian forests. Conservation Biology. Pages 284-296. Volume 17, No. 1, February 2003.

Slovkin, J.M. 1982. Habitat Requirements and Evaluations. Elk of North America. Stackpole Books, Harrisburg, Pennsylvania.

Smith, F.H. 1929. Hunters war on predatory animals. Montana Wildlife. 2(7):9.

Sonoran Institute. 2004. Prosperity in the 21st Century West: The Role of Protected Public Lands.

Stankey, George and R. Clark. 1991. Social Aspects of New Perspectives in Forestry: A Problem Analysis. Consortium for the Social Values of Natural Resources Supported by the Oregon State University and the USDA Forest Service Pacific Northwest Research Station Milford PA: Grey Towers Press.

Stanton, T.W. and J.B. Hatcher. 1905. Geology and Paleontology of the Judith River Beds. *United States Geological Survey, Bulletin 257.* Government Printing Office, Washington D.C.

Stewart, D. 1981. The biology of the sturgeon chub (Hybopsis gelida Girard) in Wyoming. Masters Thesis. University of Wyoming. Laramie.

The Wilderness Society. 2003. Ecological Effects of a Transportation Network on Wildlife: A Spatial Analysis of the Upper Missouri River Breaks National Monument.

U.S. Army Corps of Engineers. 1989. Sedimentation in Fort Peck Reservoir, 1937-1987.

U.S. Congress. 1999. 43 CFR 4130.8-1, Payment of Fees, GPO, downloaded from the Bureau of Land Management website, http://www.nv.blm.gov/range/Legs20&%20Regs/43CFR4100.htm, November 19, 2003.

U.S. Congress. 2002. 43 CFR 2930, Special Recreation Permits, downloaded from the BLM website, http://www.blm.gov/nhp/new/releases/pages/1999/recfeeqa.html, November 25, 2003.

U.S. Congress. 2002. 43 CFR 2932.

U.S. Congress. 2002. 43 CFR 41000, Objectives, GPO, downloaded from the Bureau of Land Management website, http://www.nv.blm.gov/range/Legs%20&%20Regs/43CFR4100.htm#Subpart%204100—Grazing%20Administration—Exclusive%20of%20Alaska;%20General, November 24, 2003.

U.S. Department of Agriculture (USDA). 1997. Census of Agriculture.

U.S. Department of Agriculture (USDA). 2001. Animal Plant and Health Inspection Service (APHIS), Montana State Office. Plan of Operations.

U.S. Department of Agriculture (USDA). 2002. Census of Agriculture.

U.S. Department of Agriculture, Forest Service (USFS), Northern Region. 1990. Nez Perce (Nee-Me-Poo) National Historic Trail Comprehensive Plan.

U.S. Department of Agriculture, Forest Service (USFS). 2001. Forest Roads: A Synthesis of Scientific Information. General Technical Report, PNW-GTR-509. Pacific Northwest Research Station. May.

U.S. Department of Agriculture, Natural Resources Conservation Service. 1986. *Soil Survey of Blaine County and part of Phillips County, Montana.*

U.S. Department of Agriculture, Natural Resources Conservation Service. 1988. *Soil Survey of Fergus County, Montana.*

U.S. Department of Agriculture, Natural Resources Conservation Service. 2003. *Soil Survey of Chouteau County Area, Montana.*

U.S. Department of Agriculture, Natural Resources Conservation Service. 2004. *Soil Survey of Phillips County, Montana.*

U.S. Department of Agriculture, Natural Resources Conservation Service. 2007. The PLANTS Database (http://plants.usda.gov, 22 February 2007). National

Plant Data Center, Baton Rouge, LA 70874-4490 USA.

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1977. Average Annual Precipitation Montana Based on 1941-1970 Base Period.

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1993. Soil Survey Division Staff. Soil Survey Manual. U.S. Department of Agriculture Handbook 18, p. 66.

U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis, Regional Economic Information System (REIS), 1969-2000, CD-ROM, May 2002.

U.S. Department of Labor, Bureau of Labor Statistics, www.stats.bls.gov./lau/home.htm.

U.S. Environmental Protection Agency (EPA). 1987. Criteria Document for Sulfur Dioxide, Published in U.S. Federal Register, July 1, pertaining to Code of Federal Regulations (40 CFR part 50, 51, 52, 53 and 58). Washington, D.C.

U.S. Fish and Wildlife Service (USFWS). 1977. Rocky Mountain/Southwestern Peregrine Falcon Recovery Team. Peregrine Falcon Recovery Plan, Rocky Mountain and Southwest Population. 183 p.

U.S. Fish and Wildlife Service (USFWS). 1986. Recovery Plan For The Pacific Bald Eagle. USFWS, Portland, OR. 160 pp.

U.S. Fish and Wildlife Service (USFWS). 1989. Black-Footed Ferret Survey Guidelines.

U.S. Fish and Wildlife Service (USFWS). 1993a. Recovery Plan for the Pallid Sturgeon (*Scaphirhynchus albus*). USFWS, Bismarck, ND. 55 pp.

U.S. Fish and Wildlife Service (USFWS). 1993b. Pallid sturgeon (*Scaphirhynchus albus*) recovery plan. Prepared by the Pallid Sturgeon Recovery Team for Region 6, Denver, CO.

U.S. Fish and Wildlife Service (USFWS). 1994. 50 CFR 17 58996-59000. Endangered and threatened wildlife and plants; animal candidate review. Federal Register 59:219. Washington, DC.

U.S. Fish and Wildlife Service (USFWS). 2004. Endangered and Threatened Wildlife and Plants; Finding for the Resubmitted Petition to List the Black-Tailed Prairie Dog as Threatened. Federal Register, Volume 69, No. 159, Proposed Rules. August 18.

U.S. Fish and Wildlife Service (USFWS). 2005. Endangered and Threatened Wildlife and Plants; 12 Month Finding for Petitions to List the Greater Sage-Grouse as Threatened or Endangered. Federal Register, Volume 70, No. 8, Proposed Rules. January 12.

U.S. Government Accountability Office (GAO). 2007. *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources.* Report No. GAO-07-863. August.

University of Montana – Missoula, Institute for Tourism and Recreation Research, "The Economic Review of the Travel Industry in Montana – 2004 Biennial Edition." Missoula, MT 2004. p. 15.

Voigt, D.R. and W.E. Berg. 1987. Coyote. Pages 345-357 in M. Novak, J.A. Baker, M.E. Obbard and B. Malloch, editors. Wild Furbearer Management and Conservation in North America. Ashton-Potter Limited, Concord, Ontario.

Wallestad, R.O. and D.B. Pyrah. 1974. Movement and nesting of Sage Grouse hens in central Montana. J. Wildl. Manage. 38: 630–633.

Wambolt, C. L.; A.J. Harp, B.L. Welch, N. Shaw [and others]. 2002. Conservation of greater sage-grouse on public lands in the Western U.S.: implications of recovery and management policies. PACWPL Paper SG-02-02. Caldwell, ID: Policy Analysis Center for Western Public Lands. 41 p.

Watson, Mark L. 2005. Habitat Fragmentation and the Effects of Roads on Wildlife and Habitats. Background and Literature Review, Conservation Services Division, New Mexico Game and Fish. 17 pp.

Weed Science Society of America. 2005. Invasive Plants of Range and Wildlands and Their Environmental, Economic, and Social Impacts.

Werdon, S. 1992. Population status and characteristics of *Macrhybopsis gelida*, *Platygobio gracilis* and *Rhinichthyes cataractae* in the Missouri River Basin. Masters Thesis. South Dakota State University. Brookings.

Werdon, S. 1993. Status report on sturgeon chub (*Macrhybopsis gelida*), a candidate endangered species. U.S. Fish and Wildlife Service, Ecological Services, North Dakota State Office. Bismarck.

Wilkins, B.T. 1956. Range use, food habits and agricultural relationships of the mule deer, Bridger

Mountains, Montana. Journal of Wildlife Management 21(2):159-169.

Williams, B.K., R.C. Szaro, and C.D. Shapiro. 2007. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

Williams, Gerald. 2002. Aboriginal Use of Fire: Are there any "natural" plant communities? IN: Charles E. Kay and Randy T. Simmons (eds.) *Wilderness and Political Ecology: Aboriginal Land Management – Myths and Reality.* Logan, UT: University of Utah Press.

Williams, J. E., J. E. Johnson, D. A. Hendrickson, S. Contreras-Balderas, J. D. Williams, M. Navarro-Mendoza, D. E. McAllister and J. E. Deacon. 1989. Fishes of North America endangered, threatened, or of special concern: 1989. Fisheries (Bethesda) 14(6):2-20.

Windberg, L.A. and F.F. Knowlton. 1988. Management implications of coyote spacing patterns in southern Texas. Journal of Wildlife Management 52:632-640.

Wood, Christopher K. 2004. The Effects Of Prescribed Burning on Deer and Elk Habitat Parameters in Montana's Missouri River Breaks. MS Thesis, Montana State University, Bozeman, MT. 68 pp.

Wood, P.B., M.W. Collopy and C.M. Sekerak. 1998. Post fledging nest dependence period for bald eagles in Florida. Journal of Wildlife Management 62:333-339.

Yarmoloy, C., M. Bayer, and V. Geist. 1988. Behavior Responses and Reproduction of Mule Deer does Following Experimental Harrassment with an All Terrain Vehicle. Canadian Field-Naturalist 102.

Other Sources

American Rivers 2002. http://www.amrivers.org/most endangered/2002missourireport.htm.

Askins, R.A., M.J. Philbrick and D.S. Sugeno. 1987. Relationship between the regional abundance of forest and the composition of forest bird communities. Biological Conservation 39:129-152.

Askins, R.A. 1994. Open corridors in a heavily forested landscape: impact on shrubland and forest-interior birds. Wildlife Society Bulletin 22:339-347.

Aslett, D. 1988. Big Bend Ridge-Bishop Mountain Access Management Proposal. March 31.

Auble, G.T., M.L. Scott, J.M. Friedman, J. Back and V.J. Lee, V.J. 1997. Constraints on establishment of plains cottonwood in an urban riparian preserve. Wetlands, Vol. 17:1.

Auble, G.T., J.M. Friedman and M.L. Scott. 1994. Relating riparian vegetation to present and future streamflows. Ecological Applications 4(3), pp. 544-554.

Baker, W.L. and R.L. Knight. 2000. Roads and forest fragmentation in the Southern Rocky Mountains. In: Knight, R.L., F.W. Smith, S.W. Buskirk, W.H. Romme and W.L. Baker, eds. Forest Fragmentation in the Southern Rocky Mountains. University Press of Colorado, Boulder, CO.

Beck, T.D.L. 1975. Attributes of a wintering population of sage grouse, North Park, Colorado. Thesis, Colorado State University, Fort Collins, USA.

Berry, J.D. and R.L. Eng. 1985. Interseasonal movements and fidelity to seasonal use areas by female sage grouse. Journal of Wildlife Management 49:237-240.

Bovee, K.D. and M.L. Scott. In Press. Implications of flood pulse restoration for Populus regeneration on the Upper Missouri River. Regulated Rivers.

Braun, C.E. 1987. Current issues in sage grouse management. Proceedings of the Western Association of Fish and Wildlife Agencies 67:134-144.

Braun, C.E. 1998. Sage grouse declines in western North America: what are the problems? Proceedings of the Western Association of State Fish and Wildlife Agencies 78:139-156.

Braun, C.E., M.F. Baker, R.L. Eng, J.W. Gashwiler and M.H. Schroeder. 1976. Conservation committee report on effects of alteration of sagebrush communities on the associated avifauna. Wilson Bulletin 88:165-171.

Call, M.W. and C. Maser. 1985. Wildlife habitats in managed rangelands—the great basin of southeastern Oregon. Sage grouse. United States Department of Agriculture, Forest Service, General Technical Report PNW-187, Portland, Oregon, USA.

Claar, J.J., N. Anderson, D. Boyd, M. Cherry, B. Conard, R. Hompesch, S. Miller, G. Olson, H. Ihsle Pac, J. Waller, T. Wittinger, H. Youmans. 1999. Carnivores. Pages 7.1-7.63 in Joslin, G. and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A Review for Montana.

Committee on Effects of Recreation on Wildlife. Montana Chapter of the Wildlife Society. 307 pp.

Conley, J.M. 1990. Project W-170-R-14. Statewide surveys and inventory July 1, 1989 to June 30, 1990. Idaho Department of Fish and Game.

Connelly, J.W. and C.E. Braun. 1997. Long-term changes in sage grouse *Centrocercus urophasianus* populations in western North America. Wildlife Biology 3:229-234.

Connelly, J.W. and H.W. Browers and R.J. Gates. 1988. Seasonal movements of sage grouse in southeastern Idaho. Journal of Wildlife Management 52:116-122.

Connelly, J.W., W.L. Wakkinen, A.D. Apa and K.P. Reese. 1991. Sage grouse use of nest sites in southeastern Idaho. Journal of Wildlife Management 55:521-524.

Conner, R., A. Seidl, L. Van Tassell and N. Wilkins. 2001. United States grasslands and related resources: an economic and biological trends assessment. http://landinfo.tamu.edu/presentations/grasslands.cfm.

Cowlishaw, G. 1999. Predicting the pattern of decline of African primate diversity: an extinction debt from historical deforestation. Conservation Biology 13:1183-1193.

Cully, J.F., Jr. 1993. Plague in prairie dog ecosystems: importance for black-footed ferret management. In the prairie dog ecosystem, managing for biological diversity. Montana BLM Wild. Tech. Bull. No.2. pp. 47-55.

Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, P.A. Rabie, and B.R. Euliss. 2001a. Effects of management practices on grassland birds: Burrowing Owl. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/literatr/grasbird/buow/buow.htm.

Dechant, J.A., J.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldale, P.A. Rabie, and B.R. Euliss. 2001b. Effects of management practices on grassland birds: Ferruginous Hawk. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/literatr/grasbird/ferhawk/ferhawk.htm.

Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman and B.R. Euliss. 2003. Effects of management practices on grassland birds: Mountain Plover. Jamestown (ND): Northern Prairie Wildlife Research Center. Online: http://www.npwrc.usgs.gov/resource/literatr/grasbird/mtnplove/mtnplove.htm.

DeSmet, K.D. and M.P. Conrad. 1991. Status, habitat requirements, and adaptations of ferruginous hawks in Manitoba. Pages 219-221 in Proceedings of the second endangered species and prairie conservation workshop. Provincial Museum of Alberta, Natural History Occasional Paper No.15.

Dobkin, D.S. 1992. Neotropical migrant landbirds in the Northern Rockies and Great Plains: a handbook for conservation and management. U.S. Forest Service, Northern Region, Publication No. R1-93-34, Missoula, Montana.

Duffy, W.G., C.R. Berry and K.D. Keenlyne. 1996. Biology of the pallid sturgeon with an annotated bibliography through 1994. South Dakota Cooperative Wildlife Research Unit Technical Bulletin No. 5.

Ehrlich, P.R., D.S. Dobkin and D. Wheye. 1988. The birder's handbook: a field guide to the natural history of North American birds. Simon and Schuster Inc., New York, London, Toronto, Sydney, Tokyo, Singapore.

Enyeart, G. 1956. Responses of sage grouse to grass reseeding in the Pines area, Garfield County, Utah. Thesis, Utah State Agricultural College, Logan, USA.

Erickson, J.D. 1992. Habitat selection and movement of pallid sturgeon in Lake Sharpe, South Dakota. M.S. Thesis. South Dakota State University, Brookings.

FaunaWest Wildlife Consultants. 1999. Status of the black and white-tailed prairie dogs in Montana. Helena: Montana Fish, Wildlife and Parks. 33 pp.

Fischer, R.A. 1994. The effects of prescribed fire on the ecology of migratory sage grouse in southeastern Idaho. Dissertation, University of Idaho, Moscow, USA.

Foreman, R.T.T. 2000. Estimate of the area affected ecologically by the road system in the United States. Conservation Biology. 14:31-46.

Foreman, R.T.T. and L.E. Alexander. 1998. Roads and their major ecological effects. Annual Reviews of Ecology and Systematics 29:207-231.

Foster, N.S. and S.E. Hygnstrom. 1990. Prairie dogs and their ecosystem. University of Nebraska, Lincoln, Dept. of Forestry, Fisheries and Wildlife. 8 pp.

Friedman, J.M., M.L. Scott and W.M. Lewis, Jr. 1995. Restoration of riparian forest using irrigation, artificial disturbance, and natural seedfall. Environmental Management Vol. 19, No. 4, pp. 547-557.

Friedman, Jonathan, W.R. Osterkamp and W.M. Lewis, Jr. 1996. Channel narrowing and vegetation development following a Great Plains flood. Ecology 77(7) pp. 2167-2181.

Friedman, J.M., W.R. Osterkamp and W.M. Lewis, Jr. 1996. The role of vegetation and bed-level fluctuations in the process of channel narrowing. Geomorphology Vol.14 pp. 341-351.

Friedman, J.M., M.L. Scott and G.T. Auble. 1997. Water management and cottonwood forest dynamics along prairie streams. In F.L. Knopf, F.B. Samson eds. Ecology and Conservation of Great Plains Vertebrates. Springer-Verlag New York, Inc.

Friedman, J.M., W.R. Osterkamp, M.L. Scott and G.T. Auble. 1998. Downstream effects of dams on channel geometry and bottomland vegetation: regional patterns in the Great Plains. Wetlands, Vol. 18:4 pp. 619-633.

Friedman, J.M. and Auble, G.T. 1999. Mortality of riparian box elder from sediment mobilization and extended inundation. Regulated Rivers: Research & Management 15: 463-476.

Gelbard, J.L. 2000. Roads as conduits for exotic plant invasions. 14th Annual meeting of the Society for Conservation Biology, Missoula, Montana, 9-12 June.

Gilmer, D.S. and R.E. Stewart. 1983. Ferruginous hawk populations and habitat use in North Dakota. Journal of Wildlife Management. 47(1): 146-157.

Graham, K. 1997. Contemporary status of the North American paddlefish, Polyodon spathula. Environmental Biology of Fishes 48: 279-289.

Graham, K. and J.L. Rasmussen. 1998. A MICRA perspective on closing paddlefish and sturgeon commercial fisheries. A paper presented at the Symposium on the Harvest Trade and Conservation of North American Paddlefish and Sturgeon. Chattanooga, Tennessee. May 7-8.

Gregg, M.A., J.A. Crawford, M.S. Drut and A.K. DeLong. 1994. Vegetational cover and predation of sage grouse nests in Oregon. Journal of Wildlife Management 58:162-166.

Hanf, J.M., P.A. Schmidt and E.B. Groshens. 1994. Sage grouse in the high desert of central Oregon: results of a study, 1988-1993. United States Department of Interior, Bureau of Land Management, Series P-SG-01, Prineville, Oregon, USA.

Hamann, B., H. Johnston, P. McClelland, S. Johnson, L. Kelly and J. Gobielle. 1999. Birds. Pages 3.1-3.4 in G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society. 307 pp.

Higby, L.W. 1969. A summary of the Longs Creek sagebrush control project. Proceedings, Biennial Western States Sage Grouse Workshop 6:164-168.

Hughbanks, D.L. 1993. Evaluation of a spike only regulation in southeastern Idaho. Thesis, Montana State University, Bozeman, Montana.

Hulet, B.V. 1983. Selected responses of sage grouse to prescribed fire, predation, and grazing by domestic sheep in southeastern Idaho. Thesis, Brigham Young University, Provo, Utah, USA.

Hurley, M.A. 1994. Summer-fall ecology of the Blackfoot-Clearwater elk herd of western Montana. Thesis, University of Idaho, Moscow, Idaho. 138 pp.

Johnson, R.G. and S.A. Temple. 1990. Nest predation and brood parasitism of tallgrass prairie birds. Journal of Wildlife Management 54:106-111.

Klebenow, D.A. 1969. Sage grouse nesting and brood habitat in Idaho. Journal of Wildlife Management 33:649-661.

Klebenow, D.A. 1970. Sage grouse versus sagebrush control in Idaho. Journal of Range Management 23:396-400.

Knick, S.T. and J.T. Rotenberry. 1995. Landscape characteristics of fragmented shrubsteppe habitats and breeding passerine birds. Conservation Biology 9:1059-1071.

Knight, R.L. and D.N. Cole. 1995. Wildlife responses to recreationists. Pages 51-69 in Knight and Gutzwiller, eds. Wildlife and recreationists: coexistence through management and research. Island Press, Washington, D.C. 372 pp.

Knopf, F.L. 1994. Avian assemblages on altered grasslands. Studies in Avian Biology 15:247-257.

Knopf, F.L. and F.B. Samson. Conserving the biotic integrity of the Great Plains. In S. Johnson and A. Bouzaher, eds. Conservation of Great Plains

ecosystems: current science, future options. Kluwer Academic Press, Dordrecht, Netherlands. In Press.

Knowles, C.J. 1995. A summary of black-tailed prairie dog abundance and distribution on the central and northern Great Plains. Prepared for the Defenders of Wildlife, Missoula, Montana. 65 pp.

Knowles, Craig J. and P.R. Knowles. 2000. The 1999 Montana Mountain Plover Survey Results. Unpublished Report. USDI Bureau of Land Management. Billings, MT.

Knowles, C.J. and P.R. Knowles. 1994. A review of black-tailed prairie dog literature in relation to rangelands administered by the Custer National Forest. USDA, Forest Service. 61 pp.

Leonard, K.M., K.P. Reese and J.W. Connelly. 2000. Distribution, movements, and habitats of sage grouse *Centrocercus urophasianus* on the Upper Snake River Plain of Idaho: changes from the 1950's to the 1990's. Wildlife Biology 6: In press.

Luntz Research Companies. 1999. American Views on Land & Water Conservation. Summer. 1000 Wilson Boulevard Suite 950, Arlington, VA 22209.

Lyon, L.J. 1983. Road density models describing habitat effectiveness for elk. Journal of Forestry 81:592-596.

Lyon, L.J. and A.G. Christensen. 1992. A partial glossary of elk management terms. General Technical Report INT-GTR-288. U.S. Forest Service, Intermountain Research Station, Ogden, Utah, 6 pp.

Marcus, W.A., G. Milner and B. Maxwell. 1998. Spotted knapweed distribution in stock camps and trails of the Selway-Bitterroot Wilderness. Great Basin Naturalist 58:156-166.

Miller, S.G., R.L. Knight and C.K. Miller. 1998. Influence of recreational trails on breeding communities. Ecological Application 8:162-169.

Montana Fish, Wildlife and Parks. 1996. Final Environmental Impact Statement: management of mountain lions in Montana. Helena. 138 pp.

Montana Fish, Wildlife and Parks. 1999. Montana State Trails Plan (draft). Montana FWP, Helena, MT.

Montana Fish, Wildlife and Parks. 2001. Environmental Checklist: MEPA/NEPA Amend ARM 12.2.501 to include black-tailed and white-tailed prairie dogs in the definition of "non-game wildlife in need of management." Dec.

Murphy, K.M. 1998. The ecology of the cougar (Puma concolor) in the northern Yellowstone ecosystem: interactions with prey, bears, and humans. Ph.D. Dissertation. Univ. Idaho, Moscow. 147 pp.

Natureserve. 2002. http://www.natureserve.org/publications/rivers/critical.htm.

Noss, R.F. and B. Csuti. 1994. Habitat fragmentation. Pages 237-264 in Meffe, G.K. and C.R. Carroll, eds. Principles of Conservation Biology. Sinauer Associates, Sunderland, MA.

Parendes, L.A. and J.A. Jones. 2000. Role of light availability and dispersal in exotic plant invasion along roads and streams in the H.J. Andrews Experimental Forest, Oregon. Conservation Biology 14:64-75.

Peterson, J.G. 1970. The food habits and summer distribution of juvenile sage grouse in central Montana. Journal of Wildlife Management 34:147-155.

Reading, R.P. and R. Matchett. 1997. Attributes of black-tailed prairie dog colonies in northcentral Montana. Journal of Wildlife Management 61:664-674.

Reed, R.A., J. Johnson-Barnard and W.L. Baker. 1996. Contribution of roads to forest fragmentation in the Rocky Mountains. Conservation Biology 10:1098-1106.

Reijnen, R., R. Foppen and H. Meeuwsen. 1996. The effects of traffic on the density of breeding birds in Dutch agricultural grasslands. Biological Conservation 75:255-260.

Remington, T.E. and C.E. Braun. 1985. Sage grouse food selection in winter, North Park, Colorado. Journal of Wildlife Management 49:1055-1061.

Schonewald-Cox, C. and M. Buechner. 1992. Park protection and public roads. Pages 373-395 in P.L. Fiedler and S.K. Jain eds. Conservation Biology: the theory and practice of nature conservation, preservation, and management. Chapman and Hall, New York and London.

Scott, M.L, M.A. Wondzell and G.T. Auble. 1993. Hydrograph characteristics relevant to the establishment and growth of western riparian vegetation. pp. 237-246 in H.J. Morel-Seytoux, ed., Proceedings of the Thirteenth Annual American Geophysical Union Hydrology Days. Hydrology Days Publications, Atherton, CA.

Scott, M.L, J.M. Friedman and G.T. Auble. 1996. Fluvial process and the establishment of bottomland trees. Geomorphology 14: pp. 327-339.

Scott, M.L., G.T. Auble and J.M. Friedman. 1997. Flood dependency of cottonwood establishment along the Missouri River, Montana, USA. Ecological Applications 7:2 pp. 677-690.

Scott, M.L., P.B. Shafroth and G.T. Auble. 1999. Responses of riparian cottonwoods to alluvial water table declines. Environmental Management Vol. 23: 3 pp. 347-358.

Scott, M.L., G.C. Lines and G.T. Auble. 2000. Channel incision and patterns of cottonwood stress and mortality along the Mojave River, California. Journal of Arid Environments 44: 399-414.

Shafroth, P.B., Stromberg, J.C. and Patten, D.T. 2000. Woody riparian vegetation response to different alluvial water table regimes. Western North American Naturalist. Vol. 60:1 pp. 66-76.

Shafroth, P.B., G.T. Auble, J.C. Stromberg and D.T. Patten. 1998. Establishment of woody riparian vegetation in relation to annual patterns of streamflow, Bill Williams River, Arizona. Wetlands. Vol.18:4 pp. 577-590.

Shafroth, P.B., G.T. Auble and M.L. Scott. 1995. Germination and establishment of the native plains cottonwood (Populus deltoides Marshall subsp. monilifera) and the exotic Russian-olive (Elaeagnus angustifolia L.). Conservation Biology, Vol. 9:5 pp. 1169-1175.

Small, J.F. and M.L. Hunter. 1988. Forest fragmentation and avian nest predation in forested landscapes. Oecologia 76: 62-64.

Smith, D.G., J.R. Murphy and N.D. Woffinden. 1981. Relationships between jackrabbit abundances and ferruginous hawk reproduction. Condor 83: 52-56.

Sparrowe, R.D. 1986. Threats to paddlefish habitat. Pages 36-45 in J.G. Dillard, L.K. Graham. The Paddlefish: Status, Management and Propagation, North Central Division, American Fisheries Society, Publication Number 7.

Springer, A.E., J.M. Wright, P.B. Shafroth, J.C. Stromberg and D.T. Patten. 1999. Coupling groundwater and riparian vegetation models to assess the effects of reservoir releases. Water Resources Research, Vol. 35:12 pp. 3621-3630.

State of California Off-Highway Motor Vehicle Recreation Division. 1999. Biennial Report on the Status of OHV Recreation in California, Fiscal Years 1995/96 and 1996/97. January, p. 6.

Swenson, J.E., C.A. Simmons and C.D. Eustace. 1987. Decrease of sage grouse Centrocercus urophasianus after plowing of sagebrush steppe. Biological Conservation 41: 125-132.

Trombulak, S.C. and C.A. Frissell. 2000. The ecological effects of roads on terrestrial and aquatic communities: a review. Conservation Biology 14:18-30.

Turner, M.G., R.H. Gardner, R.V. O'Neill and S.M. Pearson. 1993. Multiscale organization of landscape heterogeneity. In Jensen, M.E. and P.S. Bourgeron, eds. Eastside Forest Ecosystem Health Assessment 2. Ecosystem Management: Principles and Applications. USDA Forest Service, Northern Region, Missoula, MT.

Urban, D.L., R.V. O'Neill and H.H. Shugart. 1987. Landscape ecology, a hierarchical perspective can help scientists understand spatial patterns. Bioscience 37:119-127.

U.S. Census Bureau. 1999. http://www.census.gov/population/estimates/state.

U.S. Fish and Wildlife Service. 1995. Notice of 90-day finding on the petition to list the sturgeon chub and sicklefin chub as endangered. Federal Register (75): 19910-19914.

Van der Zande, A.N., W.J. ter Keurs and W.J. van der Weuden. 1980. The impact of roads on the densities of four bird species in an open field habitat—evidence of a long-distance effect. Biological Conservation 18:299-321.

Van Dyke, F.G., R.H. Brocke and H.G. Shaw. 1986. Use of road track counts as indices of mountain lion presence. Journal of Wildlife Management 50: 102-109.

Van Pelt, W.E. 1999. The black-tailed prairie dog conservation assessment and strategy-fifth draft. Nongame and Endangered Wildlife Program. Arizona Game and Fish Department, Phoenix, Arizona.

Vickery, P.D., J.R. Herkert, F.L. Knopf, J. Ruth and C.E. Keller. Grasslands Birds: An overview of threats and recommended management strategies. http://birds.cornell.edu/pifcapemay/vickery.htm.

Wakkinen, W.L. 1990. Nest characteristics and spring-summer movements of migratory sage grouse in

southeastern Idaho. Thesis, University of Idaho, Moscow, USA.

Wallestad, R.O. 1975. Life history and habitat requirements of sage grouse in central Montana. Montana Fish and Game Department, Technical Bulletin, Helena, USA.

Wallestad, R.O. and P. Schladweiller. 1974. Movement and nesting of sage grouse hens in central Montana. Journal of Wildlife Management 38:630-633.

Welch, B.L., J.C. Pederson and R.L. Rodriquez. 1988. Selection of big sagebrush by sage grouse. Great Basin Naturalist 48:274-279.

Welch, B.L., F.J. Wagstaff and J.A. Roberson. 1991. Preference of wintering sage grouse for big sagebrush. Journal of Range Management 44:462-465.

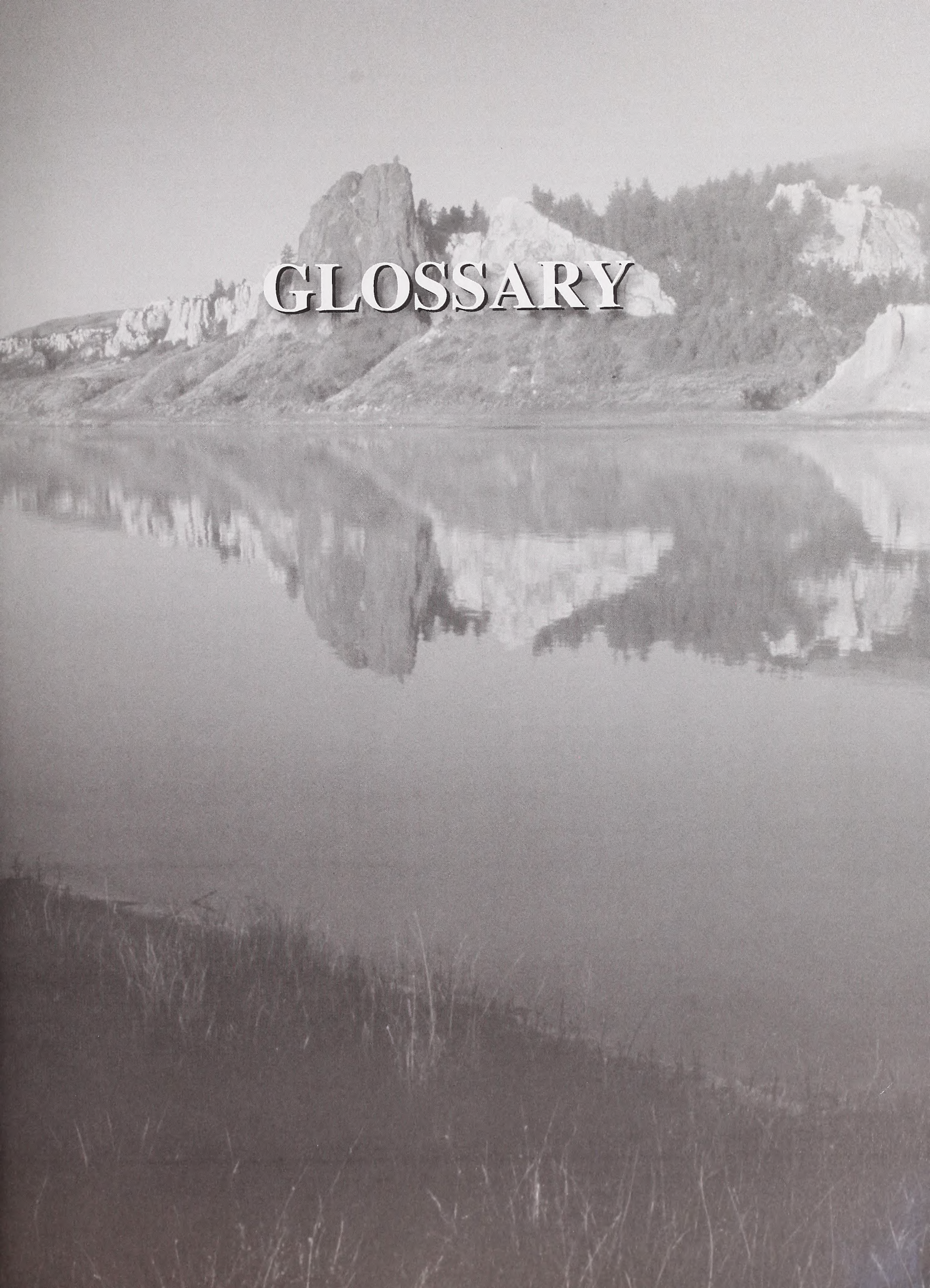
Wershler, C. 1991. A management strategy for mountain plovers in Alberta. In Proceedings of the 2nd Endangered Species and Prairie Conservation Workshop. Regina, Saskatchewan, January 1989. Provincial Museum of Alberta Natural History Occasional Paper No.15.

White, C.M. and T.L. Thurow. 1985. Reproduction of ferruginous hawks exposed to controlled disturbance. Condor 87:14-22.

Wiens, J.A. and B.T. Milne. 1989. Scaling of 'landscapes' in landscape ecology, or, landscape ecology from a beetle's perspective. Landscape Ecology 3:87-96.

Woffinden, N.D. and J.R. Murphy. 1983. Ferruginous hawk nest site selection. Journal of Wildlife Management 47(1):216-219.

Woffinden, N.D. and J.R. Murphy. 1989. Decline of a ferruginous hawk population: a 20-year summary. Journal of Wildlife Management 53(4):1127-1132.



GLOSSARY

GLOSSARY

Actual Production: Actual production that originates from a well within a Unit Participating Area (PA) or Communitization Agreement (CA) that is reported to the Unit PA or CA case number. From a federal or tribal standpoint, it usually denotes that actual production originated from a Federal or tribal well.

Adaptive Management: A decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood.

Affected Environment: The natural, physical and human-related environment that is sensitive to changes from the alternatives.

Air Quality: Refers to standards for various classes of land as designated by the Clean Air Act, PL 88-206: January 1978.

Allocated Production: Production that is allocated to a federal or tribal tract/lease within a Unit PA or CA from a non-federal or tribal well. This frequently occurs within CAs where gas is produced from a fee (private) or state well and production is allocated back to the federal or tribal tract(s)/lease(s) within the CA.

Allotment: An area of land where one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include other federally managed, state owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment Categorization: Grazing allotments and rangeland areas used for livestock grazing are assigned to an allotment category during resource management planning. Allotment categorization is used to establish priorities for distributing available funds and personnel during plan implementation to achieve cost-effective improvement of rangeland resources. Categorization is also used to organize allotments into similar groups for purposes of developing multiple use prescriptions, analyzing site-specific and cumulative impacts, and determining tradeoffs.

Alternative: A mix of management prescriptions applied to specific land areas to achieve a set of goals and objectives. Each alternative represents a different way of achieving a set of similar management objectives.

Animal Unit Months (AUMs): The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

Appropriate Management Response (AMR): Any specific action suitable to meet Fire Management Unit (FMU) objectives. Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). The AMR is developed by using Fire Management Unit strategies and objectives identified in the Fire Management Plan.

Area of Critical Environmental Concern (ACEC): An area that needs special management attention to preserve historic, cultural, or scenic values; to protect fish and wildlife resources or other natural systems or processes; or to protect life and provide safety from natural hazards.

Authorized Use: Use of BLM land for which permission has been received from the BLM through a lease, permit, or right-of-way (including, but not limited to, grazing, oil and gas, and administrative activities.

Avoidance Area. An area where environmental impacts would be difficult or impossible to mitigate. A geographic area where construction and operation of a facility are likely to damage its significant environmental values or where formally designated environmental values may pose siting or construction problems.

Best Available Control Technology (BACT): Those techniques and methods of controlling emission of pollutants from an existing or proposed source.

Best Management Practices (BMPs): Methods, measures or practices to prevent or reduce water pollution including, but not limited to, structural and non-structural controls, operation and maintenance procedures, other requirements, scheduling and distribution of activities. Usually, BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, economic and technical feasibility.

BLM Roads: A road is a linear route segment that can be created by the passage of vehicles (two-track); constructed; improved; or maintained for motorized travel. The following specifications were used to determine which routes would be inventoried for the Monument transportation plan database:

Motorized travel is not considered cross-country (off-road) on BLM land when:

- The motorized vehicle uses constructed roads that are maintained by the BLM. Constructed roads are often characterized with cut and fill slopes.
- The motorized vehicle use is clearly evident two-track routes with regular travel and continuous passage of motorized vehicles over a period of years. A two-track is where perennial vegetation is devoid or scarce, or where wheel tracks are continuous depressions in the soil yet evident to the casual observer and are vegetated.

BLM Roads – Collector Roads: These Bureau roads normally provide primary access to large blocks of land, and connect with or are extensions of a public road system. Collector roads accommodate mixed traffic and serve many uses. They generally receive the highest volume of traffic of all the roads in the Bureau road system. User cost, safety, comfort, and travel time are primary road management considerations. Collector roads usually require application of the highest standards used by the Bureau. As a result, they have the potential for creating substantial environmental impacts and often require complex mitigation procedures.

BLM Roads – Local Roads: These Bureau roads normally serve a smaller area than collectors, and connect to collectors or the public road system. Local roads receive lower volumes, carry fewer traffic types, and generally serve fewer uses. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Low volume local roads in mountainous terrain, where operating speed is reduced by effort of terrain (steep and uneven), may be single lane roads with turnouts. Environmental impacts are reduced as steeper grades, sharper curves, and lower design speeds than would be permissible on collector roads are allowable.

BLM Roads – Resource Roads: These Bureau roads normally are spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The location and design of these roads are governed by environmental compatibility and minimizing Bureau costs, with minimal consideration for user cost, comfort, or travel time.

BLM Roads Maintenance Level 1: This level is assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. These roads are no longer needed and are closed to traffic. The objective is to remove these roads from the transportation system.

BLM Roads Maintenance Level 2: This level is assigned to roads where the management objectives require the road to be opened for limited traffic. Typically, these roads are passable by high clearance vehicles and include two-track roads.

BLM Roads Maintenance Level 3: This level is assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreation, or high volume administrative access. Typically, these roads are natural or aggregate surfaced, but may include low use bituminous surfaced roads. These roads have defined cross sections with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cars traveling at prudent speeds. User comfort and convenience are not considered a high priority.

BLM Roads Maintenance Level 4: This level is assigned to roads where management objectives require the road to be open all year (except may be closed or have limited access due to snow conditions) and to connect major administrative features (recreation sites, local road systems, administrative sites, etc.) to county, state, or federal roads. Typically, these roads are single or double lane, aggregate, or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic.

BLM Roads Maintenance Level 5: This level is assigned to roads where management objectives require the road to be open all year and are the highest traffic volume roads of the transportation system.

Casual Use: Activities that involve practices which do not ordinarily cause any appreciable disturbance or damage to the public lands, resources, or improvements and, therefore, do not require a right-of-way grant or temporary use permit. Examples include (but are not limited to) the use of roads for hunting and sightseeing, and ingress/egress on existing roads and trails.

Code of Federal Regulations (CFR): The official, legal tabulation of regulations directing federal government activities.

Communitization Agreement (CA): An agreement to combine two or more mineral leases in order to have sufficient acreage to comply with the spacing required to drill a well. A CA is formed when a federal lease cannot be independently developed in conformity with an established spacing pattern. Well spacing is determined based on state regulation.

Compaction: The process of packing firmly and closely together; for example, mechanical compaction by vehicular, human or livestock activity. Soil compaction results from particles being pressed together so that the volume of the soil is reduced. It is influenced by the

physical properties of the soil, moisture content, and the type and amount of compactive effort.

Concentrations of Livestock: The result of high numbers of animals per unit area, such as high density grazing or placement of supplements or salt on a small area. Concentrations of livestock can compact soils and could displace nesting birds. Though only a guideline, an average of two pair of cattle per acre or higher may be considered concentrating of livestock. See Livestock - Stocking Density.

Conditions of Approval (COA): Conditions or provisions (requirements) under which an application for a permit to drill or a sundry notice is approved.

Controlled Surface Use (CSU): Use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the no surface occupancy or timing stipulations.

Crucial Habitat: Habitat which is basic to maintaining viable populations of fish or wildlife during certain seasons of the year or specific reproduction periods. It can describe any particular range or habitat component, but describes that component which is the determining or limiting factor in a wildlife population's ability to maintain and reproduce itself at a certain level and in good health over the long term.

Cultural Resource or Cultural Property: A definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. See Traditional Lifeway Value, Traditional Cultural Property and Definite Location. Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit. They may be, but are not necessarily eligible for the National Register. See Historic Property or Historic Resource.

Cumulative Effect: The impact on the environment which results from the incremental impact of the action when added to other actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

Definite Location: Having discernible, mappable, more or less exact limits or boundaries, on a scale that can be established by a survey crew using conventional sensing and recording equipment, by an informant's direct on-the-ground indication, or by precise placement in a documentary source (see Cultural Resource or Cultural Property). For example, an archaeological site or historic district can be said to have definite location, even when boundaries are initially recorded somewhat arbitrarily and are subject to verification.

Direct Effects: Effects on the environment which occur at the same time and place as the initial cause or action.

Disruptive Activities: Those activities that disrupt or alter wildlife actions at key times, during important activities, or in important areas (feeding, breeding, nesting, herd movement, winter habitat). Disruptive activities are those which can result in reductions of energy reserves, health, reproductive success, or population. Some examples of disruptive activities include geophysical (seismic), well plugging or work-over operations that last 24 to 48 hours or longer, and road reclamation. Emergency activities, rangeland monitoring, recreational activities, livestock grazing and management, and other field activities are not considered disruptive activities.

Ecological Site: A kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and response to management.

Endangered Species: Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range (Endangered Species Act of 1973).

Environmental Justice: Executive Order 12898, Environmental Justice, requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

Ephemeral Streams: Streams that flow only as a direct response to rainfall or snowmelt events. They have no base flow.

Erosion: Detachment or movement of soil or rock fragments by water, wind, ice or gravity. Accelerated erosion is much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of surface-disturbing activities of people, animals or natural catastrophes.

Erosion Susceptibility: The susceptibility of a soil to erosion when no protective cover is present. The rate of soil displacement depends on the physical properties of the soil, slope gradient and rainfall/snowmelt event.

Exception: Case-by-case exemption from a lease stipulation. The stipulation continues to apply to all

other sites within the leasehold to which the restrictive criteria apply.

Exclusion Area. An area unavailable for corridor designation or facility siting. A geographical area designated for its environmental values and having defined boundaries wherein facility construction or operation is prohibited.

Extended Term or Held By Production Lease: A period of time in the life of a lease beyond the initial primary term. A lease can be extended or held by production (HBP) so long as oil or gas is produced in paying quantities. Leases are also allowed to be HBP if they contain a well that is capable of production in paying quantities and may remain shut-in due to the lack of infrastructure.

Federal Minerals: Mineral interests owned by the United States Government regardless of surface ownership. All federal oil and gas mineral interests are administered by the Bureau of Land Management.

Fee Minerals: The title or minerals ownership of land; short for "owned-in-fee" or private ownership.

Floodplains: (1) A strip of relatively flat land bordering a stream, built of sediment carried by the stream and dropped in the slack water beyond the influence of the swiftest current. A water floodplain is overflowed during times of high water; a fossil floodplain is beyond the reach of the highest flood. (2) That land outside a stream channel described by the perimeter of the maximum probable flood. (3) The relatively flat area or lowlands adjoining an ocean, lake, or other body of standing water which has been or might be covered by floodwater.

Fossil: a. Originally, a rock, mineral, or other substance dug out of the earth. Now, any remains, impression, or trace of an animal or plant of past geologic ages that have been preserve din the earth's crust. b. The remains or traces of animals or plants which have been preserved by natural causes in the earth's crust, and excluding organisms which have been buried since the beginning of historic time.

Fracture Stimulation (Fraccing): An attempt to increase production from a well by subjecting the reservoir to enough hydraulic pressure for it to crack. A granular material is injected into the cracks to hold them open when the pressure is released, so that oil or gas can flow through the cracks to a well.

Geocaching: A type of scavenger hunt for waterproof containers bearing treasure using the containers' exact geographic coordinates and Global Positioning System devices.

Grazing District: The specific area within which public lands are administered under Section 3 of the Taylor Grazing Act. Public lands outside grazing district boundaries are administered under Section 15 of the Act.

Grazing Lease: A document authorizing use of the public lands outside an established grazing district. Grazing leases specify all authorized use including livestock grazing, suspended use, and conservation use. Leases specify the total number of AUMs apportioned, the area authorized for grazing use, or both.

Grazing Permit: A document authorizing use of the public lands within an established grazing district. Grazing permits specify all authorized use including livestock grazing, suspended use, and conservation use. Permits specify the total number of AUMs apportioned, the area authorized for grazing use, or both. Permit/permittee as used in this document, unless otherwise stated, refers to both grazing permits and leases/permittee/lessee.

Habitat: The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

High Stock Density: See Livestock – Stocking Density.

HiLine: The Milk River Basin/U.S. Highway 2 corridor across northern Montana.

Historic Property or Historic Resource: Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. The term includes, for purposes of these regulations, artifacts, records, and remains that are related to and located within such properties. The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria. (36 CFR 800.2(e); compare National Historic Preservation Act, Section 301, Appendix 5.) (See also Cultural Resource or Cultural Property. "Cultural property" is an analogous BLM term not limited by National Register status.

Incidental Use: Personal use of other vegetative resources on the site where they are obtained, or, if they are transported to a secondary location, personal use of the resources within a reasonable period of time by the person obtaining them.

Indirect Effects: Secondary effects which occur in locations other than the initial action or significantly later in time.

Infiltration: The downward flow of water through pores or small openings into soil or porous rock.

Irretrievable Impact: The commitment of a resource would be considered irretrievable when the project would directly eliminate the resource, its productivity, and/or its utility for the life of the project.

Irreversible Impact: The commitment of a resource would be irreversible if the project started a process (chemical, biological and/or physical) that could not be stopped. As a result, the resource or its productivity, and/or its utility would be consumed, committed, or lost forever.

Lease Notice: Provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A lease notice also addresses special items the lessee should consider when planning operations, but does not impose new or additional restrictions. Lease notices attached to leases should not be confused with notices to lessees (NTLs).

Leasehold: The entire area of a lease (could be both within and outside the Monument).

Leave No Trace: A nationwide (and international) program designed to assist visitors with their decisions when they travel and camp on America's public lands. The program strives to educate visitors about the nature of their recreational impacts as well as techniques to prevent and minimize such impacts. The Leave No Trace principles of outdoor ethics form the framework of Leave No Trace's message: 1) plan ahead and prepare; 2) travel and camp on durable surfaces; 3) dispose of waste properly; 4) leave what you find; 5) minimize campfire impacts; 6) respect wildlife; 7) be considerate of others.

Lek: An area used by sage- and sharp-tailed grouse for mating displays (strutting ground).

Livestock – Stocking Density: The relationship between the number of animals and the specific unit of land being grazed at any point in time. May be expressed in animal units per unit of land area (animal units at a specific time/area of land).

Livestock – Stocking Rate: The relationship between the number of animals and the grazing management unit utilized over a specified time period. May be expressed as animal units over unit of land area (animal units of a described time period/area of land).

Migratory Birds: Any bird listed in 50 CFR 10.13 and protected by the Migratory Bird Treaty Act (16 USC 703-711).

Mitigation: Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

Modification: Fundamental change to the provisions of a lease stipulation, either temporarily or for the term of the lease. A modification may, therefore, include an exemption from or alteration to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria applied.

Multiple Use: The harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment. (43 USC 1702). Multiple use involves managing an area for various benefits, recognizing that the establishment of land use priorities and exclusive uses in certain areas is necessary to ensure that multiple uses can occur harmoniously across a landscape.

Neotropical Birds: Birds that breed in North America and winter in tropical and subtropical America.

No Surface Occupancy (NSO): Use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values. The NSO stipulation includes stipulations which may have been worded as "no surface use/occupancy," "no surface disturbance," "conditional NSO," and "surface disturbance or surface occupancy restriction (by location)."

No Wake Speed: A speed where white water occurs in the path of the vessel or in waves created by the vessel.

Notice to Lessees (NTL): The NTL is a written notice issued by the authorized officer to implement regulations and operating orders, and serves as instructions on specific item(s) of importance within a state, district, or area.

Payment in Lieu of Taxes (PILT): Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. The key law that implements the payments is Public Law 94-565, dated October 20, 1986. The law was rewritten and amended by Public Law 97-258 on September 13, 1982 and codified at Chapter 69, Title 31 of the United States Code.

Permeability: The ease with which gases, liquids or plant roots pass through a layer of soil. Permeability is measured as the number of inches per hour that water moves downward through a saturated soil.

Perennial Streams: Streams that flow continuously throughout the year.

Personal Watercraft: A motorized recreational watercraft or vessel designed to be operated by a person sitting, standing, straddling or kneeling **on the vessel**,

rather than in the conventional manner of operation by sitting, standing or kneeling **inside** the watercraft or vessel. Models normally have an outboard or inboard engine driving a jet pump as the primary source of power. Examples include, but are not limited to, jet skis, wheeled amphibious watercraft, etc.

Planning Criteria: The factors used to guide development of a resource management plan, or revision, to ensure that it is tailored to the issue previously identified, and to ensure that unnecessary data collection and analysis are avoided. Planning criteria are developed to guide the collection and use of inventory data and information, analysis of the management situation, design and formulation of alternatives, estimation of the effects of alternatives, evaluation of alternatives, and selection of the preferred alternative.

Plant Association: A kind of climax plant community consisting of stands with essentially the same dominant species in corresponding layers.

Plant Community: An assemblage of plants occurring together at any point in time, thus denoting no particular successional status. A unit of vegetation.

Prescribed Fire: Any fire ignited by management actions to meet specific objectives.

Primary Term Lease: A legal instrument by which a leasehold is created in minerals. A contract that, for a stipulated sum, conveys to an operator the right to drill for oil and gas. The oil and gas lease is not to be confused with the usual lease of land or a building. Competitive leases are set up on a primary term of five years. Non-competitive leases are set up on primary terms of 10 years.

Prime Farmland: Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops. It has the combination of soil properties, growing season and moisture supply needed to produce sustained high yields of crops if it is treated and managed according to acceptable farming methods.

Primitive Airstrips: Unpaved, grassy landing strips with no mechanized maintenance, improvements, facilities or infrastructure (tie downs, wind socks, airstrip delineators, etc.).

Production in Paying Quantities (Lease Basis): The volume of oil or gas that is needed to exceed direct daily operating costs and the costs for lease rentals or minimum royalty of a well. This means the well must be capable of generating enough revenue to exceed the ongoing operating costs of the well, no matter how small.

Production in Paying Quantities (Unit Basis): The volume of oil or gas that is needed from a well to return reasonable profit over the costs of drilling, equipping, completing and operating the well.

Proper Functioning Condition (PFC): Riparian-wetland areas are functioning properly when they dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment and aid floodplain development; improve floodwater retention and ground water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl, breeding, and other uses; and support greater biodiversity.

Public Land or BLM Land: Any land and interest in land owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except (1) lands located on the Outer Continental Shelf; and (2) lands held for the benefit of Indians, Aleuts, and Eskimos.

Quality of Life: Culture-specific norms of desired individual and social experience. It has both subjective and objective aspects and is often measured using both existing data and peoples' statements about their beliefs and values. A related term is lifestyle, which is an individual's or group's pattern of work, home life and leisure.

Rangeland Health: The degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained.

Reclamation: Rehabilitation of a disturbed area to make it acceptable for designated use. This normally involves regrading, replacement of topsoil, revegetation and other work necessary to restore it for use.

Record of Decision: A concise public document disclosing the decision made following preparation of an EIS and the rationale used to reach that decision.

Recreation Management Area - Extensive: An area where recreation management is only one of several management objectives and where limited commitment of BLM staffing and funding for recreation is required.

Recreation Management Area - Special: An area where a commitment of BLM staffing and funding has been made, within the parameters of multiple use, to provide opportunities for specific recreation activities and experiences on a sustained yield basis.

Resource Reserve Allotment: A unit of public land that will not have term grazing permits issued. Such an allotment would only be grazed on a temporary, non-renewable basis to provide temporary grazing to rest other areas following wildfire, habitat treatments, or to allow for more rapid attainment of rangeland health. The allotment must be of sufficient size to be managed as a discrete unit. Resource reserve allotments should be distributed throughout the planning area.

Riparian Areas: Riparian areas may be associated with lakes, reservoirs, potholes, springs, bogs, wet meadows, and intermittent or perennial streams. The riparian zone occurs between the upland (terrestrial) zone and the aquatic (deep water) zone. Riparian areas are characterized by water tables at or near the soil surface, and by vegetation requiring high water tables.

Significant: An effect that is analyzed in the context of the proposed action to determine the degree or magnitude of importance of the effect, either beneficial or adverse. The degree of significance can be related to other actions with individually insignificant but cumulatively significant impacts.

Soil: The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of vegetation.

Soil Series: The lowest category of soil classification, consisting of soils that are essentially alike in all major profile characteristics except in the texture of the "A" horizon (surface layer).

Soil Survey: The systematic examination, description, classification and mapping of soils in a survey area. Soil surveys are classified according to the level of detail of field examination based on use and management. Order I is the most detailed, then Order II, on to Order V, the least detailed. As used in this EIS, most of the area was mapped at an Order III survey.

Split Estate: A term used to describe land status when the mineral estate ownership varies from the surface ownership (i.e., federal minerals/private surface). This occurs on approximately 1,640 acres within the Monument.

Spud Date: The date an operator begins drilling the well (i.e., begins drilling through the surface of the earth).

Standards for Rangeland Health: The physical or biological conditions or functions required for healthy, sustainable rangelands.

State Minerals: Mineral interests owned by the state in which they reside.

Steep Slopes: Slopes with a gradient between 20 and 60 percent.

Stipulation: A provision that modifies standard lease rights and is attached to and made a part of the lease.

Succession (Plant Succession): The progressive replacement of plant communities on a site which leads to the potential stability of a natural plant community.

Surface-Disturbing Activities: Those activities that alter the structure and composition of vegetation and topsoil/subsoil. This includes any action created through mechanized or mechanical means that would cause soil mixing or result in alteration or removal of soil or vegetation and expose the soil to erosive processes. Some examples of surface-disturbing activities include construction of roads, well pads, trenching for pipelines, construction or reconstruction of reservoirs and pits, and facility construction. Vegetation renovation treatments that involve soil penetration and/or substantial mechanical damage to plants (plowing, chiseling, chopping, etc.) are also surface-disturbing activities. Emergency activities, rangeland monitoring, recreational activities, livestock grazing and management, and other field activities are not considered surface-disturbing activities.

Timing Limitation (Seasonal Restriction): Prohibits surface use during specified time periods to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient.

Total Maximum Daily Load (TMDL): The total amount of a pollutant that a water body may receive from all sources without exceeding water quality standards. A TMDL can also be defined as a reduction in pollutant loading that results in meeting water quality standards. The TMDL process was established under Section 303(d) of the Clean Water Act. A TMDL includes both a waste load allocation, which focuses on point sources, and a load allocation, which addresses nonpoint sources.

Traditional Cultural Property: A property that derives significance from traditional values associated with it by a social and/or cultural group such as an Indian tribe or local community. See Cultural Resource or Cultural Property and Definite Location. A traditional cultural property may qualify for the National Register if it meets the criteria and criteria exceptions at 36 CFR 60.4. See National Register Bulletin 38.

Traditional Lifeway Value: A social and/or cultural group's traditional systems of religious belief, cultural practice, or social interaction, not closely identified with

definite locations. Another group's shared values are abstract, nonmaterial, ascribed ideas that one cannot know about without being told. Traditional values are taken into account through public participation during planning and environmental analysis or through tribal consultation, as applicable. Traditional values may imbue a place with historic significance (see Traditional Cultural Property).

Unit Agreement (Exploratory): An agreement or plan for the development and operation of a well site, which provides for the recovery of oil and/or gas from the lands made subject thereto as a single consolidated entity, without regard to separate ownerships, and for the allocation of costs and benefits on a basis as defined in the agreement or plan.

Unit Participating Area (PA): That part of a unit area which is considered reasonably proven to be productive in paying quantities or which is necessary for unit operations and to which production is allocated in the manner prescribed in the unit agreement.

Upland: The portion of the landscape above the valley floor or stream.

Very Steep Slopes: Slopes with a gradient greater then 45 percent.

Vibroseis: Vibroseis could be defined as one of many techniques used to acquire geophysical information about the subsurface geology. Vibroseis is essentially another method of producing the energy (dynamite is also used as an energy source) needed to create a wave into the earth and it is reflected back off of various rock formations and recorded at the surface by a sensor called a geophone. Vibroseis is done by carrying the vibrator to the field on a large vehicle and a vibrator pad is lowered to the earth's surface where weight is placed on the pad and through hydraulics the pad is vibrated for up to 20 seconds per location. An analogy of a vibrator would be tossing a pebble into a pond and the release of energy into the pond would cause waves to form.

Waiver: Permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Water Quality: The chemical, physical, and biological characteristics of water in respect to its suitability for a particular purpose.

Watershed: All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on a stream.

Wetlands: Wetland ecosystems share a number of characteristics including relatively long periods of inundation and/or saturation, hydrophytic vegetation, and hydric soils. Despite these common features, wetlands exist under a wide range of climatic, geologic, and physiographic situations and exhibit a wide variety of physical, chemical, and biological characteristics.

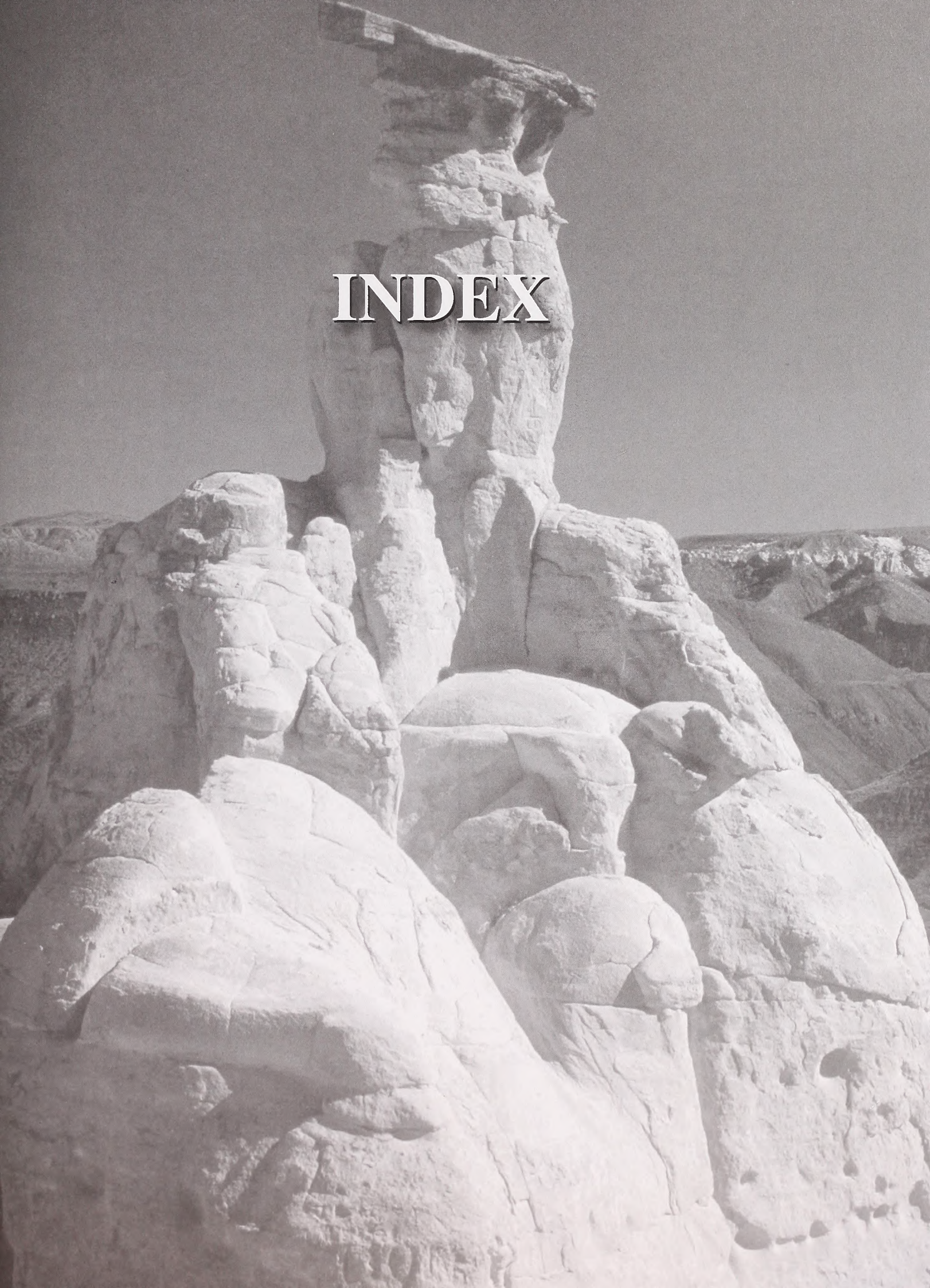
Wildcraft: The following definition is taken from Section 76-10-102, Montana Code Annotated: "(9) (a) 'Wildcraft' means to collect, harvest, or separate by cutting, prying, picking, peeling, breaking, pulling, digging, splitting, or otherwise removing uncultivated plants or plant parts from their physical connection or point of contact with the ground or vegetation upon which they are growing or from the place or position where they lay for commercial purposes. (b) The term does not include the collection of: (i) plant material used for a campfire; or (ii) amounts intended for personal consumption."

Wilderness: A wilderness, in contrast with those areas where man and his own works dominate the landscape, is recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.

Wilderness Study Area (WSA): An area determined to have wilderness characteristics. Study areas will be subject to interdisciplinary analysis and public comment to determine wilderness suitability. Suitable areas will be recommended to the President and Congress for wilderness designation. These areas are an interim designation, valid until either designated as wilderness or released to multiple use management.

Wildland Fire Use: The application of the appropriate management response to naturally-ignited wildland fires to accomplish specific resource management objectives in pre-defined designated areas outlined in Fire Management Plans. Operational management is described in the Wildland Fire Implementation Plan (WFIP). (From the NWCG Glossary of Wildland Fire Terminology)

Winter Range: A range, usually at lower elevation, used by migratory deer and elk during the winter months; usually better defined and smaller than summer ranges.

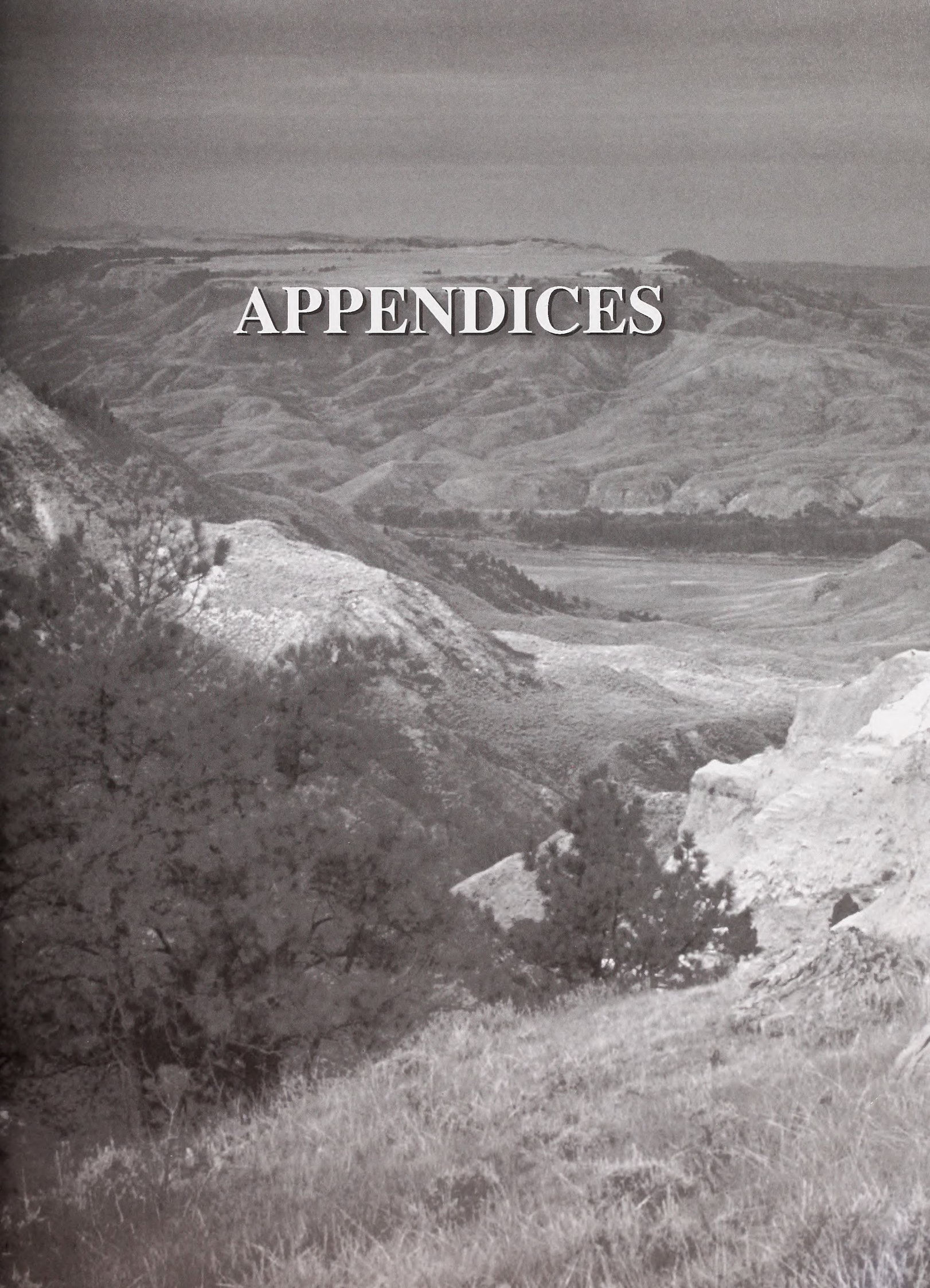


INDEX

INDEX

Access....16, 111, 204
Access and Transportation....38, 109, 284, 310, 325, 336, 349, 354, 360, 369, 382, 400, 419, 425, 439, 442, 453, 467
Affected Environment 175
Air Quality....17, 126, 175, 277
Airstrips 229
Alternative Development 12, 470
Alternatives Considered but Not Analyzed in Detail 126
American Indians 244
Analysis Assumptions and Guidelines 271
Aviation 16, 125, 227
Blackfeet Tribe 472
BLM Road Classifications/Categories 225
BLM Road Maintenance Levels 226
BLM Road System 16, 112, 225
Exceptions for Travel Off Road and on Closed Roads 115, 119, 120, 121, 122, 124
Road Classification and Maintenance....114, 119, 120, 121, 122, 123
Road System Criteria ...114, 115, 120, 121, 122, 123
Signing....115, 119, 121, 122, 124
Caves and Karst Resources 190
Central Montana Resource Advisory Council 479
Chippewa-Cree Cultural Advisory Committee 473
Class I Airshed 126
Climate 176, 271
Collaboration/Cooperating Agencies 4, 479
Comparison of Alternatives 128
Confederated Salish and Kootenai Tribes of the Flathead Nation 473
Consultation and Coordination 469, 472
Cooperating Agencies 479
Counties 487
County Roads 226
Cow Creek ACEC 238
Critical Elements 175
Crow Tribe 475
Cultural Resources....18, 176, 271, 280
Historic Overview 177
Inventory 178
Prehistoric Overview 176
Tribal Consultation 179
Current Management and Action Alternatives 38
Decisions Common to All Alternatives 16
Development of Alternatives 12
Draft Resource Management Plan 12
Easements Providing Access to and Within the Monument 227
Economic Conditions 244, 457
Environmental Consequences 271
Environmental Justice 244, 445
Final Resource Management Plan 12
Fire Management....36, 57, 230, 276, 436
Fish and Wildlife 20, 179, 272, 286
Animal Damage Control 22
Antelope....180
Bald Eagle....44, 45, 188, 273
Big Game 20
Big Game Winter Range....44, 45, 274
Bighorn Sheep 44, 45, 46, 181, 274
Black-footed Ferret 183, 273
Black-tailed Prairie Dogs....42, 44, 45, 186, 273
Cormorant 21
Deer 180
Designated Sensitive Species....44, 45, 273
Elk....180
Fish 22, 181
Great Blue Heron 21, 181
Greater Sage-Grouse....15, 41, 44, 45, 185, 272
Herptofauna 182
Migratory Birds 21
Pallid Sturgeon 184, 274
Raptors....21
Special Status Species....182
Threatened and Endangered Species 21
Upland Game Birds 21
Waterfowl 21
Fish and Wildlife – Mitigation 15, 43
Floatplanes (see Motorized Watercraft)
Forest Products/Forest Resources 51, 202, 370
Fort Belknap Community Council 475
Fort Peck Tribal Executive Board 478
General Description of Each Alternative....13
Geology 23, 189, 324
Geology – Oil and Gas 209
Health of the Land and Fire....38, 39, 281, 289, 324, 326, 342, 352, 356, 361, 367, 371, 375, 383, 402, 436, 440, 445, 461
Impacts from the Alternatives 277
Irreversible and Irretrievable Commitment of Resources 468
Issues Addressed 5
Issues Considered but Not Analyzed Further 6
Lands and Realty 20, 203, 371
Access....204
Avoidance and Exclusion Areas 204
Corridors....204
Land Ownership Adjustment....29, 57, 204
Leases and Permits 29
Lewis and Clark National Historic Trail 232
Livestock Grazing 15, 30, 127, 205, 374, 468
Locatable Minerals 190
Minerals – Oil and Gas....32, 207, 275, 383
Motorized Watercraft 72, 73, 74, 76, 78, 79
Natural Gas Exploration and Development....16, 38, 85, 278, 283, 302, 325, 330, 347, 354, 359, 364, 368, 373, 381, 385, 418, 424, 442, 451, 463

Natural Gas Operations 103
Drilling Operations 103, 104, 105, 106, 107
Plugging and Reclamation Operations 103, 104,105, 106, 107, 108
Production Operations, Facilities and Equipment 103, 104, 105, 106, 107, 108
Seismic Operations 103, 104, 105, 106, 107
Nez Perce National Historic Trail 35, 233
Nonimpairment Criteria 37
Oil and Gas 32, 87, 128, 207, 275, 383
Oil and Gas Lease Stipulations and Conditions of Approval 87
Non-West HiLine Oil and Gas Leases 96
West HiLine Oil and Gas Leases 96
Paleontology 193, 324
Plan Distribution 532
Planning Area 2
Planning Criteria 8
Prescribed Fire and Other Fuels Management 36
Prescribed Fire – Wilderness Study Areas 37
Public Participation Opportunities 469
Purpose and Need 2
Range Improvements 48, 274
Recreation 16, 33, 63, 213, 402
Fees 63, 64, 65, 66, 68, 69
Gateway Communities 63, 64, 65, 67, 68, 70
Interpretive Sites 64, 65, 66, 68, 69, 70
Recreation Management Areas 63, 64, 65, 66, 68, 69, 213
Uplands 224
Upper Missouri River 213
Research, Collection and Special Events 63, 64, 66, 67, 69, 70
Recreation in Sensitive Wildlife Habitat 64, 65, 66, 68, 69, 71
Recreation – River 213, 276
Recreation – Uplands 224, 276
Reinventory the Monument Roadless Areas with Wilderness Characteristics (Bullwhacker) 126
Related Plans 9
Relationship to BLM Policies, Plans, and Programs 10
Revised Statute 2477 30
Right-of-Way Corridors, Avoidance Areas and Exclusion Areas 15, 52, 204
Rights-of-Way 29
Saleable Minerals (Sand and Gravel and Quarry Rock) 193
Scoping 4, 469, 470
Social Conditions 238, 277, 445
Soils 23, 194, 325, 468
Solid Leasable Minerals (Bentonite, Expandable Clay, Coal) 193
Special Designations 231
State of Montana 479
Summary of Major Changes (to Decisions Common to All Alternatives and the Preferred Alternative) 15
Transportation 35, 225, 276, 424
Tribal Consultation 179, 472
U.S. Fish and Wildlife Service 227, 478
Unavoidable Adverse Impacts 468
Uplands Special Recreation Management Area 16, 80
Camping Facilities 80, 81, 82, 83
Special Recreation Permits 80, 81, 82
Upper Missouri National Wild and Scenic River 34, 213, 231
Upper Missouri River Special Recreation Management Area 16, 71
Camping Facilities 71, 73, 74, 75, 77, 78
Motorized Watercraft 72, 73, 74, 76, 78, 79
Opportunities for Boaters 71, 73, 74, 75, 77, 78
Special Recreation Permits 71, 73, 74, 77, 78
Use of Motorized Watercraft on the Upper Missouri River 128
Vegetation 46
Native Plants 24, 195, 341, 468
Crops 196
Forest and Woodlands 195
Rangelands 195
Threatened, Endangered and Sensitive Plant Species 196
Noxious and Invasive Plants 25, 198, 355
Riparian 15, 25, 196, 352
Vision and Management Goals 11
Visitor Use, Services and Infrastructure 38, 61, 299, 325, 329, 346, 353, 358, 368, 380, 402, 438, 441, 447, 462
Visual Resources 15, 26, 49, 199, 361
VRM Classes I, II, III, IV 199, 200
Water 200, 274, 367
Ground Water 200
Water Developments and Water Rights 27, 127, 201
Water Quality 27, 202
Reserved Water Rights 15, 28
Surface Water 200
Wild and Scenic Rivers (Eligible Stream Segments: Cow Creek, Eagle Creek and Dog Creek) 60, 233
Wilderness Characteristics 126, 233
Wilderness Study Areas 15, 37, 233, 439
Prescribed Fire 37
Wildland Fire 36
Wildland Fire Suppression and Rehabilitation 36



APPENDICES

APPENDIX A
Resource Advisory Council Recommendations 1999

In August 1999, the Secretary of the Interior's office asked the Central Montana Resource Advisory Council (RAC) to develop and recommend broad guidelines, or a framework, to manage BLM land in the Missouri Breaks area (DOI News Release of July 23, 1999, and RAC 1999a).

The RAC met monthly from August through December 1999 to discuss broad guidelines for the Missouri Breaks area. During the October and November meetings, the RAC hosted public meetings in Lewistown and Havre to provide opportunities for public comment about the concept of special management for these lands (RAC 1999b, 1999c). In December 1999, the RAC forwarded a 16-page recommendation package to the Secretary of the Interior's office (RAC 1999d). This package outlined the RAC's interpretation of the public comments it had gathered and offered recommendations for a number of resource programs, should the BLM land be designated for special management. The RAC recommendations are summarized below along with an explanation of how those recommendations were addressed in the RMP/EIS.

Recommendation: The BLM will remain the managing agency.

The Proclamation specified that "The Secretary of the Interior shall manage the monument through the Bureau of Land Management..."

Recommendation: The RAC has reached consensus and proposes management prescriptions for an Expanded UMNWSR corridor to include six WSAs, one ACEC and miscellaneous lands involved in blocking up this area. This expands the existing corridor by about 25%. . . ."

The Proclamation stated "...for the purpose of protecting the objects identified...all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled Upper Missouri River Breaks National Monument..." are set apart and reserved as the Monument (Appendix B - Map). This includes about 375,000 acres of public land administered by the Bureau of Land Management, including six wilderness study areas and the Cow Creek Area of Critical Environmental Concern.

Recommendation: Hunting and fishing shall be recognized as historic and traditional uses in the Expanded UMNWSR. These legitimate recreational activities (in compliance with state and federal law) shall be included in current and future management plans.

Nothing in the Proclamation "shall be deemed to enlarge or diminish the jurisdiction of the State of Montana with respect to fish and wildlife management." As discussed in the Draft RMP/EIS and Proposed RMP/Final EIS, the Montana Fish, Wildlife & Parks (MFWP) is responsible for fish and wildlife population management and the BLM will maintain and/or enhance the recreational quality of BLM land and resources to ensure enjoyable recreational experiences.

Recommendation: The Central Montana RAC requests the Secretary of the Interior to contact the Montana Congressional Delegation to ask for their assistance in seeking the appropriation of funds for the purchase of conservation easements from willing sellers on private lands along the Missouri River in Montana.

As discussed in the Preferred Alternative in the Proposed RMP/Final EIS the BLM would not pursue the acquisition of private land or easements for public access unless approached by a landowner or their representative. Easements or fee acquisition opportunities would be considered if they enhance the values of the Monument and provide legal public access to or within the Monument, or additional public access to meet management objectives, including dispersed recreation use. This could include short-term (1-5 year) campsite easements or leases from willing private landowners for alternative or additional campsites to provide dispersed camping opportunities and benefits.

Recommendation: Livestock grazing will continue at current levels within the confines of Standards and Guidelines.

Under the Proclamation, the "[l]aws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument."

The Proclamation did not mandate a need for an adjustment of forage allocated to livestock. Current availability and allocation for livestock grazing will continue in the Monument. A total of 116 allotments with about 38,000 animal unit months (AUMs) of forage are available for livestock grazing on an annual basis

(Appendix N). Livestock grazing will continue to be managed through the Lewistown District (Lewistown and Malta Field Offices) Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997). Standards for Rangeland Health apply to all public land administered by the BLM. Grazing applications will continue to be processed consistent with the BLM's regulations (43 CFR 4100).

Recommendation: The riparian areas (land directly influenced by permanent water) along the Upper Missouri National Wild and Scenic River will progress towards proper functioning condition as the result of proper management livestock, hydrology, erosion, deposition, vegetation, wildlife, people and adequate funding.

The BLM's goal is to achieve, or make significant progress toward, proper functioning condition in riparian and wetland areas and to sustain a diverse age-class and composition of riparian-wetland vegetation for maintenance and recovery of riparian-wetland areas.

As discussed in the Proposed RMP/Final EIS the BLM will maintain and/or improve the riparian-wetland areas based on proper functioning condition (PFC) and the desired plant community (Appendix J). The presence and condition of riparian vegetation provide an important role in maintaining riparian function. Riparian-wetland plant species, such as sedges, rushes, and cottonwood/willow on sites capable of supporting woody species, will be managed for age-class and composition diversity and high vigor.

Recommendation: The BLM will seek funding to assist rural emergency services and for additional maintenance of existing county roads within the Expanded UMNWSR for those counties and rural communities which are impacted by the influx of visitors due to the Lewis and Clark Bicentennial.

The Fergus, Chouteau, Blaine and Phillips County Sheriff's Departments conduct emergency services in the Monument. The BLM assists as requested with available resources. Emergency services are guided by BLM policy and administrative action.

As discussed in the Proposed RMP/Final EIS the BLM would implement an expanded amenity fee for overnight camping in Level 1 sites and an individual special recreation permit for boating the Missouri River. After the RMP is completed the BLM would develop a business plan to determine the actual fee amounts charged for new sites. Development of the business plan would involve the Central Montana RAC and include an opportunity for public involvement. Fees associated with the special area permit to boat the Missouri River would be returned to the Lewistown Field Office and used to cover management costs associated with toilet pumping, trash collection, site maintenance and the seasonal workforce. In addition, fees could be used to support county emergency services and to purchase short-term campsite easements or leases from willing private landowners.

Recommendation: Ban commercial recreational overflights over the Upper Missouri National Wild and Scenic River Corridor.

The Monument is located beneath the Hays Military Operations Area (MOA). The Hays MOA overlies a large portion of northcentral Montana at altitudes ranging from 300 feet above ground level, up to 18,000 feet above mean sea level. The Federal Aviation Administration has the responsibility to plan, manage, and control the structure and use of all airspace over the United States, including the Hays MOA. This recommendation is beyond the scope of the RMP since the BLM has no jurisdiction or authority for this MOA.

Recommendation: Personal watercraft (such as jet skis) shall be prohibited from the entire 149-mile stretch of the UMNWSR from the bridge at Fort Benton to the bridge at Kipp Recreation Area the entire year.

This recommendation was addressed under Alternative E in the Draft RMP/EIS and Proposed RMP/Final EIS where personal watercraft would not be allowed on the entire stretch of the Upper Missouri National Wild and Scenic River.

Under the Preferred Alternative in the Proposed RMP/Final EIS, personal watercraft would only be allowed on the first three miles of the river (River Mile 0 to 3) near Fort Benton.

Recommendation: None of the management objectives recommended by this advisory council apply to that portion of the Upper Missouri National Wild and Scenic River located within the city limits of Fort Benton.

The boundary for the Upper Missouri National Wild and Scenic River and Upper Missouri River Breaks National Monument is bank to bank for the river in Fort Benton. The BLM has no jurisdiction over private land, and these lands are not part of the Monument.

Recommendation: Motorized watercraft on the wild and scenic portions of the UMNWSR will be restricted as follows:

(1) All motorized use will be "no-wake" from the Saturday before Memorial Day to the Sunday after Labor Day. (Current Management Policy)

(2) Watercraft used for river and land management purposes or for emergencies are exempt from "no-wake" restrictions but must be operated in a safe manner.

(3) BLM will develop, post at launch points and enforce rules on the proper way for motorized craft to approach and pass other motorized and non-motorized craft.

This recommendation is addressed under Alternative A (Current Management) in the Draft RMP/EIS and Proposed RMP/Final EIS.

Under the Preferred Alternative in the Proposed RMP/Final EIS, motorized use on the river would be allowed with seasonal limitations on upstream travel and a seasonal no-wake speed restriction in the wild and scenic segments of the UMNWSR from June 15 to September 15. In addition, the wild and scenic segment from Holmes Council Island to Fred Robinson Bridge would be restricted to non-motorized watercraft from June 15 to September 15 on Sunday through Wednesday.

Under the Preferred Alternative in the Proposed RMP/Final EIS, the administrative use of motorized watercraft would occur during the seasonal restrictions. A cooperative effort among agencies operating on the river would be initiated. A Memorandum of Understanding would be developed with the goal of achieving uniform standard operating procedures designed to minimize impacts to boaters from administrative use of motorized watercraft.

Recommendation: RAC propose a two year moratorium on licensed river outfitters with no implied rights.

Under the Preferred Alternative in the Proposed RMP/Final EIS there would be a limit of 23 SRPs for commercial recreational use on the Missouri River and related land in the UMNWSR. An SRP, with a fee, would be required (43 CFR 2930). The 23 permits would include boating on the Missouri River for commercial hunting, fishing, and scenic and interpretive tours. This would continue the moratorium on licensed river outfitters.

Recommendation: The BLM will give immediate high priority in achieving the funding necessary to coordinate and cooperate with other governmental agencies, grazing districts, weed control districts, permittees, and adjacent land owners to control the existence and spread of noxious weeds. Control of weeds should be given high priority using biological, animal, manual, and where appropriate, EPA approved chemical control. Informing the public about noxious weeds and how to identify and avoid their spread should also be incorporated in management of the public lands.

The management of noxious and invasive plants will continue as prescribed in the Upper Missouri River Breaks National Monument: Guidelines for Integrated Weed Management (BLM 2001b). This weed management plan was developed to conform to the Montana Weed Management Plan (2001, 2005), and provides guidelines for the prevention, containment and eradication of invasive and noxious plants, and for the coordination of BLM, state, county and private weed management efforts. The Integrated Weed Management plan will be updated on a periodic basis as a result of monitoring data.

The BLM will coordinate with other agencies consistent with the National Invasive Species Management Plan (NISC 2001) and the State of Montana's Aquatic Nuisance Species (ANS) Management Plan (Montana ANS Steering Committee, 2002) to control non-native species that cause or may cause significant negative impacts and do not provide an equivalent benefit to society.

The BLM will designate the Monument as a weed management area to facilitate cooperation among landowners and various federal, state, and county agencies, and to secure funding to implement integrated weed management control measures.

The BLM will identify weed prevention areas and emphasize activities to keep weed seed and regenerative plant parts from being introduced into weed free areas. Implementation of an early detection and rapid response program would ensure new infestations are identified early and aggressively managed to protect and maintain uninfested areas.

The BLM will increase public awareness of invasive plant and weed species and develop treatment and prevention strategies to control noxious weeds in and around developed and primitive recreation use areas.

The BLM will develop treatment strategies to contain and/or eradicate weed infestations throughout the Monument using integrated weed management methods.

Recommendation: The BLM will seek adequate funding to carry on liaison with the Lewis and Clark Trail Heritage Foundation, the Nez Perce Trail Association, the River and Plains Society, the Blaine, Phillips, Hill, Judith Basin, and Fergus County Historical Societies, and other interested entities, and the Native Americans to identify and interpret the historical significance of sites and trails within the Expanded UMNWSR. Such liaisons will emphasize the importance of local communities and reservations

in educating the public about these sites and interpret them appropriately.

Under the Preferred Alternative in the Proposed RMP/Final RMP the BLM would encourage and sustain collaborative partnerships, volunteers and citizen-centered public service. The BLM would partner with gateway communities to provide visitor information.

Historic, archaeological, and geological opportunities on BLM land would be enhanced by developing the interpretive potential at selected sites. Small, low-key interpretive signs that blend in with the surroundings (and not visible from the Missouri River) would be established at specific sites. These low-key sites would be for dispersed recreation opportunities. Simple markers would be provided for some cultural sites. Portable interpretation (guidebooks and brochures) may also be available.

Topics for interpretation would be selected based on setting, visitor benefits and the potential to provide the area's history or prehistory via interpretation. Some potential cultural sites for interpretation would include Decision Point; Eagle Creek; the Murray/PN dugout; Hagadone, Middleton, Ervin, Gist, Cable, and Nelson homesteads, Gilmore cabin; Nez Perce Trail; and sites associated with the Lewis and Clark Expedition. Other possible interpretive sites and topics could include prehistoric sites and the steamboat era on the Missouri River.

Some potential geological interpretive sites would include the stratigraphic cross section of the Missouri River from Virgelle to the James Kipp Recreation Area showing the regional dip of beds starting in Colorado Shale and ending in Bearpaw Shale; the glacial geomorphology and paleo channel of the Missouri River at Little Sandy Creek; the igneous dike known as the Grand Natural Wall from the Lewis and Clark Journal entry; Hole-in-the-Wall; the Big Sag at Judith Landing; the Sugarloaf Rock fault plane vs. bedding plane at Stafford Ferry; the diatreme at Gist Bottom; and the invertebrate paleo site at Woodhawk.

Recommendation: The Central Montana RAC requests the Secretary of Interior, the Montana State Director, the Congressional Delegation, and the Governor to cooperatively seek $500,000 for each of the next two years to be earmarked for UMNWSR river studies and mobilization of management policies.

Decisions from an RMP would be implemented over a period of years depending on budget and staff availability. Funding levels affect the timing and implementation of management actions and project proposals, but do not affect the decisions made in an RMP. This recommendation is addressed by BLM policy and budget systems.

Recommendation: The RAC requests that the Secretary and the BLM implement a policy which addresses, but is not limited to the following issues:

1. Number and distribution of visitors: The RAC recognizes that not only will the Lewis and Clark Bicentennial have a major impact on the number of visitors, but that there is an increasing demand by the public to use their public lands. Visitor use limits may have to be imposed to ensure that the intrinsic qualities of the area are preserved.

- **What types of campsites, if any, should be established and at what locations.**
- **If additional sanitation facilities are needed, they should be located and constructed in the least intrusive manner possible.**
- **Visitor access to the Upper Missouri Breaks must have as its priority the protection of the resource first.**

2. Types and distribution of trails: Cattle and game trails are part of the natural setting and evolve and even disappear as the natural setting evolves. Trails designed basically for human use are usually seen as much more intrusive and demand constant maintenance, especially in a badlands setting. The integrity of the resource must be given priority in the planning and construction of any trails.

3. Public responsibility: The Secretary and the BLM should implement a policy to inform the public that a visit to the area involves risks and demands skills. Visitors will have to assume responsibility for their actions and their own safety. The RAC feels that many of our attempts to make areas safe for visitors and tourists alters and degrades the very qualities people seek from these areas.

4. The BLM shall conduct surveys and compile river use data in a timely and ongoing manner. Results will be utilized cooperatively by the BLM and the RAC's subgroup to formulate river management and resource recommendations to the Central Montana RAC. When applicable, recommendations by the RAC subgroup must comply with those specific parameters directed by the RAC in its December 1999, recommendations to the Secretary of the Interior.

1. Under the Preferred Alternative in the Proposed RMP/Final EIS the BLM would not develop an allocation system for visitor use on the Missouri River. In response to changes in visitor use patterns the BLM would address management options to meet river management goals and maintain Limits of Acceptable

Change (LAC) standards, indicators and desired future conditions. The BLM would monitor conditions and develop management actions, as necessary, to reduce impacts to resource and social conditions without limiting the number of people boating the Missouri River. Management actions may include, but would not be limited to, further restrictions on group size, limits on number of nights allowed at one site, designated campsites, closure of campsites, construction of additional facilities, and development of additional dispersed campsites. Standards and Indicators establish a broad framework for managing visitor use and impacts to resources and social conditions. As monitoring confirms change in visitor use patterns and impacts, or as populations shift or other major social events occur that may dramatically change use patterns, additional refinement within those standards and indicators may become necessary.

The existing camping facilities would remain at the current campsites along the Missouri River. Additional Level 1 and 2 sites would only be considered from Fort Benton downstream to Judith Landing. To provide dispersed recreation opportunities and benefits, additional Level 1 sites would be constructed only in the recreation segments of the UMNWSR. Improvements to existing Level 1 and 2 sites could occur to improve infrastructure or address visitor use issues. Additional Level 2 sites could be constructed between Fort Benton and Judith Landing as necessary to improve resource conditions, improve distribution of visitor use or resolve visitor use conflicts. Associated facilities and construction could not detract from the visual character and integrity of the UMNWSR. No additional Level 2 sites would be constructed below Judith Landing. Additional Level 3 campsites could be added as needed to accommodate increases in use, disperse visitor use along the Missouri River, and rest or rotate the use of individual sites. Dispersed camping (Level 4 opportunities) would be allowed on all BLM land.

2. The recreation emphasis will be to develop and maintain opportunities for dispersed recreational activities such as hunting, hiking, scenic and wildlife viewing and driving for pleasure, consistent with current policies and practices and the Proclamation. The BLM will emphasize dispersed recreation opportunities including hiking and development of non-motorized hiking trails.

3. The BLM will maintain and/or enhance the recreational quality of BLM land and resources to ensure enjoyable recreational experiences. The Fort Benton River Management Station/Missouri Breaks Interpretive Center will support visitor services for the UMNWSR and provide interpretive information on the cultural and natural history of the Monument. Access points at the Chouteau County Fairgrounds Campground and Canoe Launch, Fort Benton Power Boat Ramp, Wood Bottom, Coal Banks Landing, Judith Landing and James Kipp Recreation Area will serve as points of contact to provide health and safety information, register boaters, and collect visitor use information.

The BLM will continue, and may expand, visitor services operations to provide for public health, safety and law enforcement. Search and rescue operations and law enforcement will continue as a cooperative effort between the BLM and state and local agencies.

4. As discussed in the Recreation section of Chapter 3 in the Draft RMP/EIS and Proposed RMP/Final EIS visitor use data is collected throughout the year by means of boater registration. From May 1 through September 30 volunteer hosts and a seasonal workforce support the collection effort by registering boaters at their put-in point. During the shoulder season, data collection efforts rely on boaters self-registering prior to launch.

Information collected on boater registration forms is analyzed and compiled to provide statistics about certain visitor use patterns and characteristics. Statistics and information are compiled in the following categories: number of boaters, number of groups and related group size statistics, number of residents and non-residents, busiest and slowest launch days, seasonal visitor use distribution, percent of motorized and non-motorized craft, percent of use occurring in each of the three river segments, and percent of use by group type.

In 1999, the RAC established the Upper Missouri River RAC Subgroup to analyze the recreational activities on the UMNWSR and to make recommendations to the RAC concerning future management opportunities for the river. Over the course of 3 1/2 years, the subgroup worked with the BLM and the University of Montana to generate high quality information concerning visitor expectations, resource conditions, and the potential to align recreation use with the objectives of landowners, residents, and businesses in the area. In January and March 2002, the subgroup presented a series of recommendations concerning a variety of people-management issues on the UMNWSR, and many of the recommendations were approved by the RAC (RAC 2002a, 2002b). The subgroup translated its prior work into ideas that could be incorporated in the RMP and presented its recommendations in a May 2003 report to the RAC (RAC 2003).

Recommendation: The RAC recommends that if a special designation is warranted, the Secretary, the Montana Congressional delegation and the Governor's office will work together to draft legislation incorporating the RAC's recommendation.

Drafting legislation is beyond the scope of the RMP.

Recommendation: Request BLM to prepare a five-year needs assessment and identify ways in which those needs might be met through the appropriations process and other sources.

This recommendation is addressed by BLM policy and budget systems.

Recommendation: The Central Montana Resource Advisory Council implores the Secretary of the Interior to use all the power and influence of his office to encourage the President, the Office of Management and Budget, and the Congress of the United States to live up to the commitments made and implied by Public Law 103-397 by permanently funding PILT at its authorized level.

This recommendation is beyond the scope of the RMP. Public lands held by the federal government are not included in the property tax base for the counties. As a result, counties forego tax revenue that they would have received if the land were privately owned. To reimburse the counties for these monies, the U.S. Congress passed Public Law 94-565 in 1976 that allows compensation for foregone property tax revenues to each county. This compensation, Payments in Lieu of Taxes (PILT), is the payment made by the federal government every fiscal year to each county in order to offset lost property tax revenues. The amounts actually appropriated by Congress are usually less the amounts indicated by the PILT payment formulas.

Recommendation: OHV use be limited within the Expanded UMNWSR to designated roads and trails with the exceptions of administrative uses and land management purposes.

The Proclamation states, "the Secretary shall prohibit all motorized and mechanized vehicle use off road, except for emergency or authorized administrative purposes." In addition, the Secretary "shall prepare a transportation plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects."

According to the Proclamation, these BLM lands are designated as "limited" consistent with 43 CFR 8340. A limited area means an area restricted at certain times, in certain areas, and/or to certain vehicular use, such as no off-road travel. A single track trail system for motorized travel (ATVs, quads, motorcycles, etc.) is not authorized or permissible in the Monument. All motorized and mechanized vehicles must stay on roads.

Recommendation: The Central Montana Resource Advisory Council advises the BLM to discourage subdivisions and commercial development along the expanded UMNWSR.

The BLM has no jurisdiction over private land.

As discussed under the Preferred Alternative in the Draft RMP/EIS and Proposed RMP/Final EIS the BLM would encourage private sector initiatives as a means of developing river visitor use opportunities. The Monument offers a wide range of visitor opportunities, only some of which can be provided by the BLM. To overcome these limitations, non-governmental entities, either individuals or institutions, could help accomplish initiatives compatible with the Monument. These initiatives would not result in permanent facilities in the Monument.

A wide variety of activities can be generated by private sector initiatives. Services for boats or horses, overnight or extended-stay lodging facilities, food/water and other provision sales and guiding are services traditionally offered in this way. Other opportunities may be created by using the Monument for touring and instructional purposes and for expanded regional promotional activities.

Recommendation: DNRC and BLM engage in a land exchange program within the Upper Missouri National Wild and Scenic corridor to divest the state of its interest in the corridor.

As discussed in the Draft RMP/EIS and Proposed RMP/Final EIS the BLM will explore the feasibility of a land exchange program with the Montana Department of Natural Resources and Conservation. Such exchanges would focus on state lands that would contribute to the objects for which the Monument was designated.

APPENDIX B

Proclamation 7398 of January 17, 2001

Establishment of the Upper Missouri River Breaks National Monument

Presidential Documents

Proclamation 7398 of January 17, 2001

Establishment of the Upper Missouri River Breaks National Monument

By the President of the United States of America

A Proclamation

The Upper Missouri River Breaks National Monument contains a spectacular array of biological, geological, and historical objects of interest. From Fort Benton upstream into the Charles M. Russell National Wildlife Refuge, the monument spans 149 miles of the Upper Missouri River, the adjacent Breaks country, and portions of Arrow Creek, Antelope Creek, and the Judith River. The area has remained largely unchanged in the nearly 200 years since Meriwether Lewis and William Clark traveled through it on their epic journey. In 1976, the Congress designated the Missouri River segment and corridor in this area a National Wild and Scenic River (Public Law 94–486, 90 Stat. 2327). The monument also encompasses segments of the Lewis and Clark National Historic Trail, the Nez Perce National Historic Trail, and the Cow Creek Island Area of Critical Environmental Concern.

Lewis and Clark first encountered the Breaks country of the monument on their westward leg. In his journal, Clark described the abundant wildlife of the area, including mule deer, elk, and antelope, and on April 29, 1805, the Lewis and Clark expedition recorded the first big horn sheep observation by non-Indians in North America. Lewis' description of the magnificent White Cliffs area on the western side of the monument is especially vivid, and not just for his sometimes colorful spellings:

"The hills and river Clifts which we passed today exhibit a most romantic appearance.... The bluffs of the river rise to hight of from 2 to 300 feet and in most places nearly perpendicular; they are formed of remarkable white sandstone which is sufficiently soft to give way readily to the impression of water...

"The water in the course of time ... has trickled down the soft sand clifts and woarn it into a thousand grotesque figures, which with the help of a little immagination and an oblique view, at a distance are made to represent eligant ranges of lofty freestone buildings, having their parapets well stocked with statuary; collumns of various sculptures both grooved and plain, are also seen supporting long galleries in front of these buildings; in other places on a much nearer approach and with the help of less immagination we see the remains or ruins of eligant buildings; some collumns standing and almost entire with their pedestals and capitals; others retaining their pedestals but deprived by time or accident of their capitals, some lying prostrate an broken othe[r]s in the form of vast pyramids of conic structure bearing a serees of other pyramids on their tops...

As we passed on it seemed as if those seens of visionary inchantment would never have and [an] end; for here it is too that nature presents to the view of the traveler vast ranges of walls of tolerable workmanship, so perfect indeed are those walls that I should have thought that nature had attempted here to rival the human art of masonry..."

The monument is covered with sedimentary rocks deposited in shallow seas that covered central and eastern Montana during the Cretaceous period.

Glaciers, volcanic activity, and erosion have since folded, faulted, uplifted, and sculpted the landscape to the majestic form it takes today.

The area remains remote and nearly as undeveloped as it was in 1805. Many of the biological objects described in Lewis' and Clark's journals continue to make the monument their home. The monument boasts the most viable elk herd in Montana and one of the premier big horn sheep herds in the continental United States. It contains essential winter range for sage grouse as well as habitat for prairie dogs. Lewis sent Jefferson a prairie dog specimen which was, as Lewis noted at the time, "new to science." Abundant plant life along the River and across the Breaks country supports this wildlife. The lower reach of the Judith River, just above its confluence with the Missouri, contains one of the few remaining fully functioning cottonwood gallery forest ecosystems on the Northern Plains. Arrow Creek, originally called Slaughter River by Lewis and Clark, contains the largest concentration of antelope and mule deer in the monument as well as important spawning habitat for the endangered pallid sturgeon. An undammed tributary to the Missouri River, Arrow Creek is a critical seed source for cottonwood trees for the flood plain along the Missouri.

The cliff faces in the monument provide perching and nesting habitat for many raptors, including the sparrow hawk, ferruginous hawk, peregrine falcon, prairie falcon, and golden eagle. Several pairs of bald eagles nest along the River in the monument and many others visit during the late fall and early winter. Shoreline areas provide habitat for great blue heron, pelican, and a wide variety of waterfowl. The River and its tributaries in the monument host forty-eight fish species, including goldeye, drum, sauger, walleye, northern pike, channel catfish, and small mouth buffalo. The monument has one of the six remaining paddlefish populations in the United States. The River also supports the blue sucker, shovel nose sturgeon, sicklefin, sturgeon chub, and the endangered pallid sturgeon.

The Bullwacker area of the monument contains some of the wildest country on all the Great Plains, as well as important wildlife habitat. During the stress-inducing winter months, mule deer and elk move up to the area from the river, and antelope and sage grouse move down to the area from the benchlands. The heads of the coulees and breaks also contain archeological and historical sites, from teepee rings and remnants of historic trails to abandoned homesteads and lookout sites used by Meriwether Lewis.

Long before the time of Lewis and Clark, the area was inhabited by numerous native tribes, including the Blackfeet, Assiniboin, Gros Ventre (Atsina), Crow, Plains Cree, and Plains Ojibwa. The confluence of the Judith and Missouri Rivers was the setting for important peace councils in 1846 and 1855. In 1877, the Nez Perce crossed the Missouri and entered the Breaks country in their attempt to escape to Canada. The Cow Island Skirmish occurred in the Breaks and was the last encounter prior to the Nez Perce surrender to the U.S. Army at the Battle of Bear Paw just north of the monument. Pioneers and the Army followed Lewis and Clark in the 1830s establishing Fort Piegan, Fort McKenzie, and Fort Benton. Remnants of this rich history are scattered throughout the monument, and the River corridor retains many of the same qualities and much of the same appearance today as it did then.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Upper Missouri River Breaks National Monument:

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Upper Missouri River Breaks National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Upper Missouri River Breaks National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 377,346 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument. The establishment of this monument is subject to valid existing rights. The Secretary of the Interior shall manage development on existing oil and gas leases within the monument, subject to valid existing rights, so as not to create any new impacts that would interfere with the proper care and management of the objects protected by this proclamation.

The Secretary of the Interior shall prepare a transportation plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation.

For the purpose of protecting the objects identified above, the Secretary shall prohibit all motorized and mechanized vehicle use off road, except for emergency or authorized administrative purposes.

Lands and interests in lands within the proposed monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management, pursuant to applicable legal authorities, including the National Wild and Scenic Rivers Act, to implement the purposes of this proclamation.

Because waters of the Upper Missouri River through the monument area have already been reserved through the Congress's designation of the area as a component of the National Wild and Scenic River System in 1976, this proclamation makes no additional reservation of water, except in two small tributaries, the Judith River and Arrow Creek. These tributaries contain outstanding objects of biological interest that are dependent on water, such as a fully functioning cottonwood gallery forest ecosystem that is rare in the Northern Plains. Therefore, there is hereby reserved, as of the date of this proclamation and subject to valid existing rights, a quantity of water in the Judith River and Arrow Creek sufficient to fulfill the purposes for which this monument is established. Nothing in this reservation shall be construed as a relinquishment or reduction of any water use or rights reserved or appropriated by the United States on or before the date of this proclamation.

Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Montana with respect to fish and wildlife management.

Nothing in this proclamation shall be deemed to enlarge or diminish the rights of any Indian tribe.

Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument.

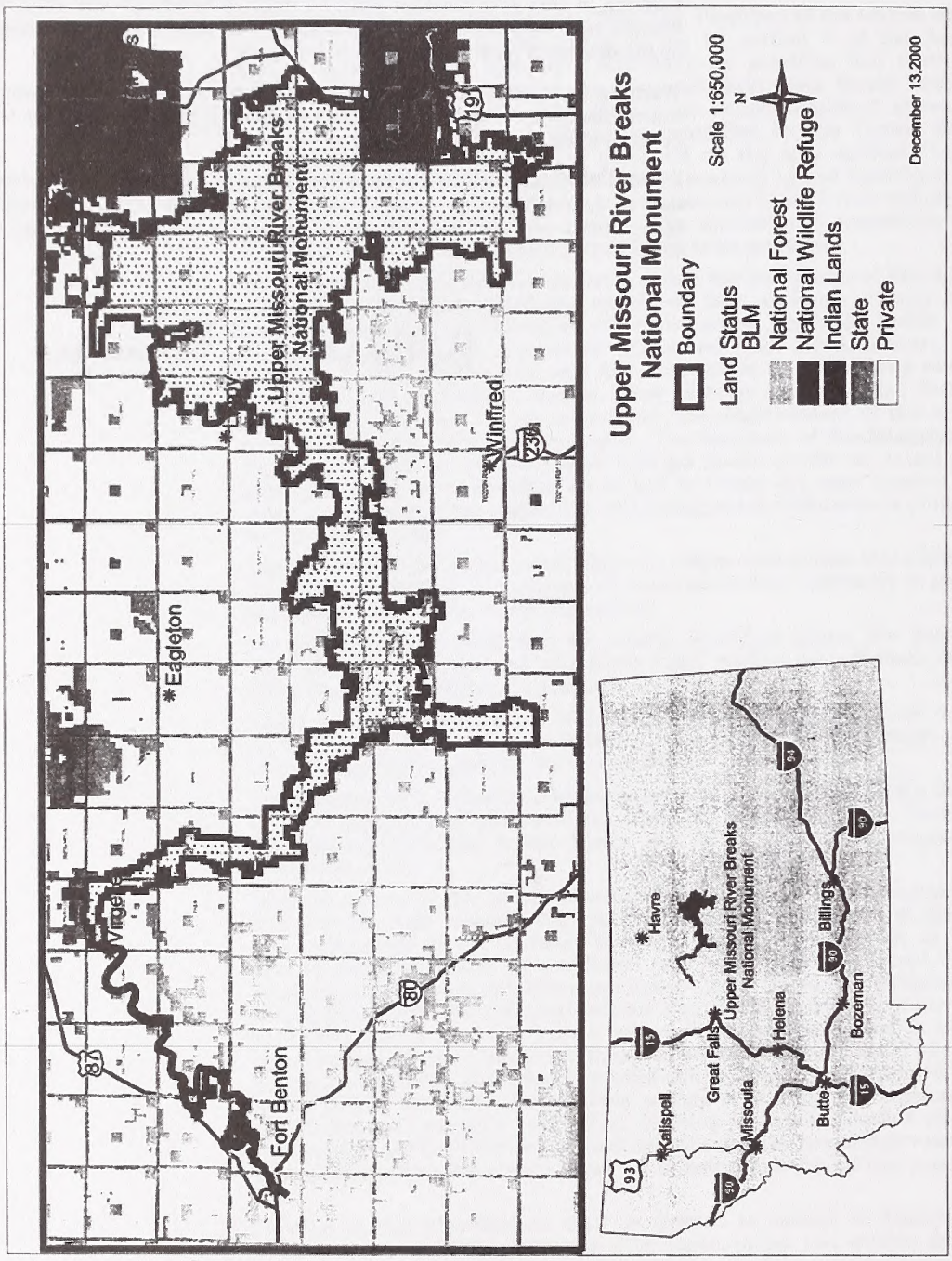
Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation.

Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this seventeenth day of January, in the year of our Lord two thousand one, and of the Independence of the United States of America the two hundred and twenty-fifth.

William J. Clinton

Billing code 3195–01–P



[FR Doc. 01–2103

Filed 1–19–01; 8:45 am]

Billing code 3195–01–C

APPENDIX C
Natural Resources on BLM Land
Upper Missouri River Breaks National Monument

Introduction

The Upper Missouri River Breaks National Monument was established on January 17, 2001, when President Clinton issued a Proclamation under the provisions of the Antiquities Act of 1906. The Monument contains a spectacular array of biological, geological, and historical objects of interest. When the Proclamation was issued a Listing of Significant Objects was available to the public along with other background material including a Summary of the Monument.

The Listing of Significant Objects provides a description of special management areas, areas of prehistoric interest, areas of historic interest, areas of geologic interest, and areas of biological interest. This list did not replace the objects identified in the Proclamation establishing the Monument and the list is not referenced in the Proclamation. The list does describe many of the natural resources on public land that the BLM manages for in the Missouri Breaks. This Appendix describes only those resources on BLM land.

Areas of Special Management

Upper Missouri National Wild and Scenic River (UMNWSR)

Congress designated 149 miles of the Upper Missouri as a component of the National Wild and Scenic River System in 1976 calling it an irreplaceable legacy of the historic American West. Congress further stated that the river, with its immediate environments, possesses outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, and other similar values. BLM was directed to preserve the Upper Missouri River in a free-flowing condition and protect it for the benefit of present and future generations. Many of the items listed in this document are the same objects that were used to determine the significance and need for the Wild and Scenic designation.

Location: The UMNWSR boundary starts at Fort Benton, Montana and runs 149 miles downstream to the James Kipp Recreation Area.

Cow Creek Area of Critical Environmental Concern (ACEC)

The 14,270-acre Cow Creek ACEC contains segments of the Nez Perce National Historic Trail, the Cow Island Trail and the Lewis and Clark National Historic Trail. It also includes portions of the Cow Creek Wilderness Study Area.

Location: Southeastern Blaine County.

James Kipp Recreation Area

The James Kipp Recreation Area is a campground at the terminus of the 149-mile UMNWSR. The 210-acre site is totally surrounded by lands managed by the U.S. Fish and Wildlife Service, Charles M. Russell National Wildlife Refuge. Although the existing recreation area is located on Corps of Engineers land, the BLM has a long-term lease to manage the recreation area which includes a boat ramp and fish cleaning station, campsites, potable water, sewage dump station and vault toilets.

Location: Terminus point of UMNWSR.

Cow Creek Wilderness Study Area

This WSA covers 34,050 acres on the north side of the Missouri River and 21,590 acres have been recommended as suitable for wilderness designation. The size of the area, opportunities for solitude and primitive recreation, and the attractiveness of the setting combine to provide excellent wilderness quality. A diversity of recreational opportunities makes this area excellent for primitive recreational use, and a four-mile-long sheer wall of sandstone is an outstanding scenic feature.

Location: Blaine and Phillips Counties.

Stafford Wilderness Study Area

This WSA covers 4,800 acres on the north side of the Missouri River. More than 90 percent of the WSA is within a rugged portion the UMNWSR corridor. None of this WSA was recommended for wilderness designation because its small size and configuration allows it to be affected by offsite sights and sounds, and because of a high potential for natural gas development. This WSA contains isolated areas that offer outstanding opportunities for solitude, but does not contain outstanding primitive recreation opportunities.

Location: Chouteau and Blaine Counties.

Ervin Ridge Wilderness Study Area

The WSA covers 10,200 acres on the north side of the Missouri River and 5,061 acres along the southern boundary of the WSA are within a wild segment of the UMNWSR corridor. None of this WSA was recommended for wilderness designation due to a variety of resource conflicts and manageability concerns including a high potential for natural gas development. The area is very scenic and rugged, combining steep slopes with narrow ridges.

Location: Blaine County.

Dog Creek South Wilderness Study Area

The WSA is on the south side of the Missouri River and contains 5,150 acres and 3,902 acres are within the UMNWSR corridor. None of this WSA was recommended as suitable for wilderness designation due to the high potential for natural gas development and the potential for wilderness management conflicts. The small size of this area, along with terrain that opens to major off-site influences just beyond its boundaries, limits the opportunities for outstanding solitude to isolated areas in the deeper drainages.

Location: Fergus County.

Woodhawk Wilderness Study Area

This 8,100-acre WSA is on the south side of the Missouri River. About 3,500 acres of the WSA are within the UMNWSR corridor. None of the WSA was recommended as suitable for wilderness designation due to a combination of the unit's small size, a cherry-stemmed road running through the WSA, and several resource conflicts. It has a high potential for natural gas reserves. The WSA has colorful broken topography, and several prehistoric occupation sites are in the area. During the steamboat era, woodhawkers (wood cutters) cut timber to fuel steamboats plying the Missouri River. The Nez Perce Indians probably traversed the area in their attempt to escape to Canada in 1877.

Location: Fergus County.

Antelope Creek Wilderness Study Area

The WSA covers about 12,350 acres on the north side of the Missouri River and 9,600 acres have been recommended for wilderness. This WSA offers outstanding opportunities for solitude and provides a diversity of primitive recreational opportunities such as hiking, photography, hunting, and rock climbing. The area is rich in historical significance, including Kid Curry's Outlaw Hideaway.

Location: Phillips County.

Lewis and Clark National Historic Trail

The Lewis and Clark Trail was designated a segment of the National Historic Trail System in 1978. The expedition passed through the Missouri Breaks area in May 1805 and on the return trip in July 1806. Lewis writes about the "white cliffs" and the "breaks" in his journals as the expedition traveled and camped along the Missouri. It is one of the few landscapes along the entire Lewis and Clark National Historic Trail that has remained relatively unchanged since the Lewis and Clark Expedition passed through this area.

Location: 12 Lewis and Clark campsites along the UMNWSR.

Nez Perce (Nee-Me-Poo) National Historic Trail

The Nez Perce National Historic Trail, which crosses the Missouri River Breaks, was designated a component of the National Historic Trail System in 1986. The 1,170-mile route was used by the Nez Perce Indians in an attempt to escape to Canada in 1877. Their escape was marked by more than 20 battles and skirmishes. The Cow Island skirmish, which occurred in the Missouri River Breaks on September 23, 1877, was the last encounter prior to the Nez Perce surrender at the Battle of the Bear Paw just north of the Breaks.

Location: Fergus and Blaine Counties.

Upper Missouri National Wild and Scenic River Watchable Wildlife Area

The entire UMNWSR was designated a Watchable Wildlife Area in 1990 because of the unique and diverse wildlife populations that abound along the river. Visitors come from around the world to view the wildlife.

Location: UMNWSR.

Missouri Breaks Back Country Byway

The Missouri Breaks Back Country Byway was designated in 1993. The Byway has more than 75 miles of gravel and unimproved roads that traverse portions of the Missouri River Breaks and lead to scenic overlooks of the UMNSWR.

Location: UMNWSR.

Areas of Historic Interest

Homesteading

Most of the Missouri River bottom was homesteaded during the early part of the 20th century or left federal ownership through the Stockraising or Desert Land Acts. The Breaks contains the remains of several early agricultural developments on BLM land. The Ervin, Hagadone, Middleton and Nelson homesteads have standing structures that are eligible for the National Register and are within the UMNWSR. The Gilmore homestead is within the Missouri Breaks, but outside the UMNWSR boundary.

Location: Various within UMNWSR and Missouri Breaks.

Fur Trade and Forts

Immediately following the Lewis and Clark Expedition, fur traders, primarily based out of St. Louis, began working their way up the Missouri to secure furs, either through trapping or through trade with the Indians. In addition, two Canadian-based British companies had established fur trade in the northern Great Plains and northern Rocky Mountains. With the influx of settlers and fur trappers to the area, Indian tribes, primarily the Blackfeet, kept the area in peril thus delaying the establishment of trading posts. In 1831, Fort Piegan was established at the mouth of the Marias. Many of the forts were short-lived, fluctuating with the trade relationship with the Blackfeet. In 1847, Fort Clay was established and was soon renamed Fort Benton. This fort became the most important trading center in what was to become Montana and was the head of the navigation on the Missouri River.

Location: Various locations along river.

White Rocks Historic District

This is a collection of natural features and cultural sites encompassing the White Rocks region of the Missouri. A special feature included within the White Rocks Historic District is some historical graffiti. The U.S.S. Mandan was a government snag boat which worked on the Missouri from the 1880s to 1910. One of the crewmen aboard this ship painted "USS Mandan" in a grotto near Eagle Creek. The historic period graffiti is still visible.

Location: UMNWSR.

Dauphin Rapids Historic District

This area was known as a dangerous stretch of river for steamboats, and was often referred to in their historic accounts.

Location: River miles 100 – 104.

Cow Island Trail

This early trail was part of the transportation network which supplied the Montana gold fields in the 1860s and 1870s. Steamboats moved freight up the Missouri River to Fort Benton and bull trains distributed the goods. The Cow Island Trail was used to freight supplies from Cow Island to Fort Benton when the river was too low for boats to reach Fort Benton.

Location: Chouteau County.

Areas of Geologic Interest

Eagle Sandstone Formation

A light gray to buff colored coarse grained sandstone with ferruginous concretions. It was deposited as beach and barrier facies during regression of an inland sea that covered the central area of the North American Continent during the Cretaceous Period. The formation derives its name from, and is located on, Eagle Creek at its confluence with the Missouri River. It weathers to form statuesque features, arches and hoodoos. Some of the natural features carved from this formation are Eye of the Needle, Hole in the Wall, Steamboat Rock and Seven Sisters.

Location: White Rocks portion of the UMNWSR, from Virgelle to the mouth of Arrow Creek.

Judith River Formation

Gray to Yellowish, massive sandstone interbedded with silty mudstones and lignites containing a wide variety of fossil flora and fauna. It formed as a lagoonal deposit when there were many river deltas and tidal flats on the edge of the transgressing Bearpaw sea during late Cretaceous time. It is an abundant source of petrified wood and invertebrate fossils, and extensive vertebrate bone beds also exist. Some duck bill dinosaur finds from this formation are on display at the Museum of the Rockies in Bozeman, Montana.

Location: The formation is named for, and is located at, the mouth of the Judith River near PN Bridge.

Bearpaw Formation

Dark gray to black thinly bedded shale with calcareous concretions. It was deposited in the deepwater environment of the Cretaceous sea. It is a source of marine shellfish fossils known as ammonites and baculites. Marine reptiles called plesiosaurs and masosaurs have also been found.

Location: The exposed formation starts in the Cow Creek area and extends downstream to Fort Peck Dam.

Hell Creek/Lance Formation

Dark gray to red and green sandstones, siltstones, carbonaceous shales and lignites are present. They were deposited in a lowland area after the last regression of the Cretaceous age Bearpaw sea. These are the latest Cretaceous-aged rocks exposed in the sequence of fossilized beds and are the source of the T-Rex specimens on display at the Museum of the Rockies.

Location: Lower Missouri River Area including the Charles M. Russell Wildlife Refuge.

Alkalic Intrusions

These fine-grained igneous rocks, dominated by dark-colored minerals occur as dikes, sills and stocks injected into fractures in the Cretaceous Age sandstones and shales. They range in age from Tertiary to late Cretaceous. They are more resistant to weathering than the enclosing sedimentary rocks causing them to form promontory features in the surrounding terrain. Some of these that have been named along the river are Dark Butte, LaBarge Rock, Citadel Rock and Pilot Rock. Some of the natural features north of the river are Eagle Buttes, Birdtail Butte and Chimney Rock.

Location: From the Bears Paw Mountains on the north to the Highwood Mountains on the south. They occur throughout the Missouri Breaks but are more visible in the White Cliffs area due to the color contrast.

Saskatchewan Butte

An erosional remnant of a volcanic vent rising about 200 feet above the surrounding terrain located on federal land. The Butte is about 10 acres in size and has potential for gemstone occurrence. It is typical of other features described as the Missouri Breaks Diatremes in numerous professional papers and mineral reports prepared by the U.S. Geological Survey and Bureau of Mines.

Location: North side of the Missouri River near Bull Creek.

Areas of Biological Interest

Diversity of Vegetative Communities

The combination of Missouri Breaks and Missouri River vegetation communities results in an impressive variety. The Missouri Breaks is a unique landscape composed of mostly timbered coulees and drainages leading from the higher plains down to the Missouri or its tributaries. These timbered draws are composed of ponderosa pine and/or Douglas fir with a smaller component of Rocky Mountain juniper. An understory of various native grasses and forbs exists. Ridge tops and benches in the area support the sagebrush/prairie grassland communities typical of the Northern Great Plains/Northern Rockies. River communities show a wide variety of vegetative types with some examples being cottonwood gallery forest types, green ash climax type, silver sagebrush and black greasewood types and many others.

Location: Throughout the Missouri River Breaks area.

Wildlife

The variety of vegetation along the river and its associated areas provides habitat for a diverse wildlife population. More than 60 mammals, 233 species of birds and 20 species of amphibians and reptiles inhabit these areas. The river itself is home to 48 species of fish ranging from the half-ounce minnow to the 140 pound paddlefish.

Mammals: The area between the river's edge and the mixed forested, sagebrush steppe and agricultural land along the canyon rims provides valuable habitat for several species of mammals. Probably the most significant of these mammals are the special status black tailed prairie dog and five big game animals: bighorn sheep, elk, mule deer, whitetail deer and pronghorn antelope. The canyon areas also provide habitat for predator species. Mountain lions appear to be doing well in the breaks portions of the corridor.

Birds: Of the 233 species of birds that inhabit the corridor, the bald eagle is on the T&E list and the peregrine falcon and mountain plover are considered special status species. The cliff faces provide perching and nesting habitat for many raptors and other birds. The more significant and abundant of the cliff nesters (golden eagle, prairie falcon, sparrow hawk, and Canada geese) are using some of the cliffs adjacent to water to nest in. There are four species of upland game birds present in the corridor: gray partridge, sharp-tailed grouse, sage grouse, and ringnecked pheasant. Two other species along the river are the white pelican and the great blue heron.

Fish: Forty-eight species of fish are found in this area of the Missouri River and its tributaries. Of these, the pallid sturgeon is on the T&E list and five are considered to be special status species: blue sucker, paddlefish, sauger, sicklefin chub, and sturgeon chub. Walleye, channel catfish, and shovelnose sturgeon are also present.

Location: River corridor and surrounding environments.

Threatened and Endangered Fish – Pallid Sturgeon

Pallid sturgeon were listed as federally endangered in 1990. This species has also been listed as a Montana Species of Special Concern (MSSC) since the list was first started in 1979. The first record of pallid sturgeon in the Missouri dates back to the late 1880s. It is believed that construction and operation of Canyon Ferry, Tiber, and Fort Peck dams/reservoirs have altered habitat and fragmented pallid sturgeon populations to the point that they are now threatened with extinction. Pallid sturgeon recovery is in its initial stages and consists of protection of the gene pool by stocking hatchery-reared fish and re-creating the important spring pulse of the Marias River.

Location: Various habitat areas along the Missouri River.

Special Status Mammal – Black tailed Prairie Dog

The black tailed prairie dog was eligible for listing but precluded by the USFWS in February 2000. Even though prairie dog towns are limited due to topography, the opportunity for black-footed ferret occupation and other species associated with prairie dog towns (burrowing owls, ferruginous hawks, and mountain plovers) exists. Prairie dog towns provide unique habitat that attracts a large number of wildlife species, particularly predators such as coyotes and badgers.

Location: Small towns scattered throughout the UMNWSR, primarily in the Bullwhacker and Cow Creek drainages.

Special Status Bird – Bald Eagle

Bald eagles have historically nested on the Missouri River and there are several known long-term active nests. There is suitable habitat to support additional bald eagle nests on the river. One limiting factor may be the distribution of stands of large cottonwoods along the river. The Missouri River is an important stop for spring and fall migrant eagles that nest further north.

Location: Various habitat areas along the Missouri River.

Special Status Bird – Peregrine Falcon

The Peregrine Falcon is one of the few species to be de-listed from T&E status. The Missouri River corridor has excellent potential to support breeding pairs of peregrine falcons put none have been positively identified at this point. Several adult peregrines have been seen near the river in the last few years. Approximately 24 young peregrines have been released at a hack site on the Missouri River since 1993 and there are at least two other hack sites in the Fergus county area that have released similar numbers of birds.

Location: Cliff nesting sites along the river corridor provide potential habitat.

Special Status Bird – Mountain Plover

This species is proposed to be listed as threatened by the USFWS. Mountain plovers would most likely occur on shortgrass prairie habitat which is very limited in the UMNWSR, but they are also known to nest on or near prairie dog towns. They are attracted to the prairie dog town due to the lack of vegetative cover and abundant insects that consume prairie dog dung.

Location: No direct observations documented to date. Potential habitat on any of the prairie dog towns in the corridor, particularly on the larger towns in the Bullwhacker and Cow Creek drainages.

Special Status Fish – Sauger

The sauger is a game fish that was added to the MSSC list in June 2000 because of the widespread declines in sauger populations throughout Montana. This designation recognizes that sauger are more vulnerable to relatively minor disturbances to its habitat and deserves careful monitoring of its status. A severe decline in sauger numbers was first noticed in 1989. Populations remained very low through 1997, especially in the reach between Great Falls and at the confluence of the Judith River. The drought conditions in the late 1980s and early 1990s are thought to have been the reason for the decline.

Location: The sauger is commonly found throughout the Missouri River and its tributaries.

Special Status Fish – Paddlefish

Paddlefish is a very popular game found in the Breaks portion of the river. Because of its biological vulnerability, it was placed on the original MSSC list in 1979. Paddlefish once migrated up the Marias River, however, recent surveys have failed to confirm their presence there. It is believed that operations of Tiber Dam have contributed to their abandonment of this tributary stream. Evidence of spawning has been documented as far up river as Coal Banks, although the bulk of spawning probably occurs down river of Cow Creek. The paddlefish population in the Missouri appears to be stable.

Location: Paddlefish are most commonly found seasonally from Fort Peck Reservoir to Coal Banks during the spawning season (May-July).

Special Status Fish – Blue Sucker

Because of the Blue Sucker's biological vulnerability it was listed as a MSSC in 1994. The species prefers

sections of river with large substrates and steep gradients, such as the White Rocks section. The blue sucker conservation status here is steady, however, there does not appear to be normal numbers of juveniles. Comparisons of size (age) structures over the past 20 years indicate the population is stable with low recruitment.

Location: Blue suckers have been found throughout the Missouri and Marias Rivers.

Special Status Fish – Sicklefin Chub

Sicklefin chub were found in the Missouri in 1979. Because of significant declines throughout its range, it was petitioned for federal protection in 1990. Presently, USFWS is under litigation for not listing this species. Sicklefin has been classified as a MSSC since 1979. Populations appear to be stable.

Location: This species is found in moderate numbers from Cow Creek to Fort Peck Reservoir. They are only found in the Missouri River, preferring turbid water and deep water areas with sand bars.

Special Status Fish – Sturgeon Chub

Sturgeon chub were found in the Missouri in 1979. Because of significant declines throughout its range, it was petitioned for federal protection in 1990. Presently, USFWS is under litigation for not listing this species. Sturgeon Chub has been classified as a MSSC since 1979.

Location: Cow Creek to Fort Peck Reservoir. They are also found in some tributaries, preferring turbid water and deep water areas with sand bars.

APPENDIX D
Governor's Task Force Recommendations

In 2001, Secretary of the Interior Gale Norton asked local officials for their ideas regarding federally mandated land use management plans for new national monuments. In response to this request, Montana Governor Judy Martz appointed a task force to develop recommendations for the Secretary of the Interior. The task force conducted three public meetings to gather public input and also solicited written comments. Approximately 1,700 letters were received. In August 2001, the Governor's Task Force provided nine recommendations for the Secretary's consideration (Montana 2001). These recommendations were considered during the development of this RMP/EIS. The recommendations are summarized below along with an explanation of how the recommendations were addressed in the RMP/EIS.

Recommendation: The Task Force recommends that the Antiquities Act be clarified so the Act is used in a less subjective manner, and is confined to the true intent of the Act.

The BLM does not have the authority to change (or clarify) the Antiquities Act. This recommendation is beyond the scope of the RMP/EIS.

Recommendation: The Task Force recommends that the BLM work to attain appropriations that will allow for the acquisition of conservation easements. Conservation easements should be between willing buyer/seller and the money shall not be used for the acquisition of private property.

In the Draft RMP/EIS, private land or easement acquisitions would only be considered with willing sellers. This has been clarified in the Proposed RMP/Final EIS. The BLM would coordinate with state agencies and county governments to improve public access to BLM land. Easements or fee acquisition opportunities would only be considered with willing landowners to enhance the values of the Monument and provide legal public access to or within the Monument, or additional public access to meet management objectives, including dispersed recreation use. Land and Water Conservation Funds may be used for land acquisitions (either fee or conservation easement) but only with willing landowners.

Recommendation: The water right reserved pursuant to the Presidential Proclamation is to be removed from Arrow Creek and the Judith River. The federal government shall respect the legal process and follow it at a state and local level.

The BLM does not have the authority to remove the reserved water rights from the Proclamation. The BLM is currently collecting hydrologic data from both the Judith River and Arrow Creek. The BLM needs to know the magnitude, timing, and frequency of flows necessary to support the outstanding water-dependent biological resources and cottonwood galleries that were the basis for the reserved water rights. Once this data collection is complete, the BLM will begin negotiations with the Reserved Water Rights Compact Commission to quantify its claimed reserved right. After June 30, 2009, the Reserved Water Rights Compact Commission no longer has authority to negotiate reserved water rights. The process of quantifying this reserved right then must be adjudicated through the state court system.

Montana law provides for the Montana Reserved Water Rights Compact Commission, a state-appointed body, to negotiate with the various federal agencies and tribal governments who claim reserved water rights. This process provides for public input throughout the negotiation process and requires that the Montana legislature, Governor of Montana and Secretary of the Interior approve any settlement proposal. The BLM has not requested a negotiation at this time and cannot reach a decision on the assertion of the federal reserved right without further information on base and flood flows along with public input.

Additional information and clarification is included in the Proposed RMP/Final EIS on the reserved water rights.

Recommendation: The Task Force acknowledges that grazing is an acceptable use on monument lands and is important to local economies. The Task Force recommends that grazing should be viewed as a compatible activity on monument lands.

Under the Proclamation, the "[l]aws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument."

The Proclamation and Monument designation did not mandate a need for an adjustment of forage allocated to livestock. All BLM land currently available and allocated for livestock grazing will continue in the Monument. A total of 116 allotments with about 38,000 animal unit months (AUMs) of forage are available for livestock grazing on an annual basis (Appendix N). Livestock grazing will continue to be managed through the Lewistown District (Lewistown and Malta Field

Offices) Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997). Standards for Rangeland Health apply to all public land administered by the BLM.

Additional information and clarification is included in the Proposed RMP/Final EIS under Livestock Grazing.

Recommendation: The Task Force recommends that the Secretary of Interior adjust the monument boundaries to include only the current Wild and Scenic River designation as their preferred recommendation to the Secretary and the President of the United States.

The BLM does not have the authority to change the Proclamation or adjust the boundary of the Monument. This recommendation is beyond the scope of the RMP/EIS.

Recommendation: If the Secretary is unable to incorporate the primary recommendation of the Task Force, then the second recommendation of the Task Force shall be to allow private property owners the ability to have their land drawn out of the boundary. The recommendation does not pertain to private property contained within the Wild and Scenic boundary designation as those lands are already included in the Wild and Scenic boundary. The recommendation allows for private property owners to choose to include their private property within the monument designation or to exclude their private property from the monument designation.

While the BLM does not have the authority to adjust the boundary of the Monument it is within BLM's discretion to exclude the boundary line from the maps that show the Monument. With the exception of Figure 1.1 in the Draft RMP/EIS and the map included with the Proclamation in Appendix A, the BLM did not include the Monument boundary on the other maps at the end of Chapters 2 and 3 and the larger foldout maps located in the back of the document. However, the maps did include the boundary for the Upper Missouri National Wild and Scenic River (UMNWSR).

Recommendation: The Task Force recommends that all rights of way, existing trails, roads and new applications for rights of way or ancillary facilities be processed and honored in the same fashion as prior to the designation of the monument.

In the Draft RMP/EIS, applications for rights-of-way will be considered pursuant to existing policies and practices, identified transportation and utility corridors, identified avoidance and exclusion areas, valid existing rights, and as necessary for adequate and reasonable access to state or private land as well as access for utility or transportation services.

Applications for rights-of-way will also be considered for necessary and adequate access across BLM land to private and state minerals for exploration, development, and production (e.g., access roads and pipelines).

Additional information and clarification is included in the Proposed RMP/Final EIS under Lands and Realty.

Recommendation: The Task Force recognizes the importance of the multiple use concepts, and that multiple use of monument lands, including natural gas development is important to Montana's economy and value system. The only aspect of multiple uses that the Task Force agrees is not compatible with the monument designation and management is the development of oil.

As discussed in the Draft RMP/EIS and Proposed RMP/Final EIS, the BLM's vision is to manage the Monument in a manner that maintains and protects its biological, geological, visual and historic objects and preserves its remote and scenic character. The RMP will incorporate the Proclamation, multiple use and existing laws, while recognizing valid existing rights and authorizations, and providing diverse recreational opportunities. The BLM will manage these lands in a multiple use manner consistent with the Proclamation and all current law and policy.

The BLM's goal is to provide reasonable oil and gas exploration and development on existing leased land without diminishing the objects of the Monument. Leases issued for federal minerals are available for both natural gas and oil development. All oil and gas lease activities on these leases would be subject to existing laws (e.g., Clean Water Act, Endangered Species Act, National Historic Preservation Act, etc.). However, the BLM does not have the authority to exclude oil development on an oil and gas lease.

Recommendation: The Task Force recognizes that there is no one special place along the Missouri River. The entire area is special. However, the Wild and Scenic Corridor is the most special of the entire area.

As discussed in the Draft RMP/EIS and Proposed RMP/Final EIS, the Monument would be included in two special recreation management areas (SRMA): Upper Missouri River SRMA and Uplands SRMA (Map E). The Upper Missouri River SRMA includes BLM land from Fort Benton downstream to Arrow Creek and the entire UMNWSR. Specific management for the Upper Missouri River SRMA, which primarily includes management for the UMNWSR, is addressed in the RMP/EIS.

APPENDIX E
Scoping Issues

A planning issue is a "concern or controversy about existing and potential land and resource allocations, levels of resource use, production, and related management actions." An issue is a subject of interest or concern to the public or a particular group. This usually means that one or more individuals or groups are interested in a resource or land use on public land, that each may have different values for the resource, and that there are different ways (opportunities or alternatives) to resolve the issue. Issues may be identified by local, state or national needs or may reflect conditions specific to the Monument. Issue identification is an ongoing process. Identified issues may change throughout the planning process as new concerns are identified and others resolved.

Management concerns are issues that can be resolved by the BLM or another agency. While some concerns overlap issues, a management concern is generally more important to an individual or a few individuals, as opposed to a planning issue, which has a more widespread point of interest. Addressing management concerns in the Monument Resource Management Plan (RMP) helps ensure a comprehensive examination of BLM's land use management. Management concerns will be modified as the planning process continues; however, they will usually not be addressed in an RMP as thoroughly as an Issue.

Preliminary issues and management concerns were identified in the Preparation Plan for the Monument RMP (February 2002). These early issues were identified by the BLM and other agencies at meetings, and/or were brought up by individuals and groups by way of phone calls, emails, letters, and past meetings concerning the proposed monument designation. They represented the BLM's expectations (prior to scoping) about what concerns or problems exist with current management. These preliminary issues were displayed during the scoping open houses and included in the June 2002 Newsletter.

The preliminary issues were then modified based on the scoping comments. Scoping also identified a new issue: economic and social conditions (Scoping Report 2002 and January 2003 Newsletter).

Issues Addressed

The major issues addressed in the Monument RMP are listed below, some of which overlap one another. Each major issue or theme has a number of different sub-issues and management concerns which address more specific uses and resources related to the topic.

Issue 1: How will human activities and uses be managed?

Issue 2: What facilities and infrastructure are appropriate to provide visitor interpretation and administration of the Monument?

Issue 3: How will the BLM manage biological, historical, cultural, and visual values of the Monument?

Issue 4: How will Monument management be integrated with other agency and community plans?

Issue 5: How will transportation and access be managed?

Issue 6: How will Monument management affect economic and social conditions in the area?

Issue 1: How will human activities and uses be managed?

The Monument provides a variety of activities and uses. Recreational activities include motorized and non-motorized touring; upland game bird and big and small game hunting; backpacking; horseback riding; sightseeing; pleasure driving; river floating; motorized river boating; and the backcountry use of small fixed-wing aircraft on primitive landing strips. A subgroup of the Central Montana RAC addressed visitor use recommendations for the river portion of the Monument. The designation of the Bear Paw Battlefield National Park in 2005, may result in increased use along the Nez Perce National Historic Trail. A new BLM interpretive center in Fort Benton, which is under construction and scheduled to open in 2006, will focus on Monument values and uses both on the Missouri River and in the uplands.

Commercial guides and outfitters, operating under special recreation permits from the BLM, provide services related to some recreational activities such as hunting and river floating. Increased visitation has led to increased demands for visitor services, requests for outfitter permits, requests for aerial tours of the Monument, and a higher demand for emergency services such as search and rescue.

A number of non-recreational uses also occur in the Monument, including rights-of-way for roads, utility lines and communication sites, livestock grazing, etc. All of these activities have an effect on the area environment and on local communities surrounding the Monument. Careful management of these activities is crucial to protecting the Monument resources.

In some instances, such as oil and gas leasing within the Monument, valid existing rights are in effect and must be recognized in the RMP. In March 2000, the Montana Wilderness Association filed suit challenging BLM's issuance of three of these leases, alleging the BLM did not fully comply with NEPA, the Endangered Species Act, and the National Historic Preservation Act. In March 2004, the Montana Federal District Court ruled in favor of the plaintiffs and ordered the BLM to prepare an EIS for the oil and gas leasing program that covers the three leases. The leases involved in the suit, as well as nine others in the Monument, were based on the BLM's 1988 West HiLine RMP. In light of the court's ruling, the BLM believes all 12 leases in the Monument and based on the West HiLine RMP should be analyzed in this Monument RMP. This RMP will consider the current stipulations that apply to the 12 leases issued under the West HiLine RMP, and the conditions of approval or mitigating measures that should be applied to surface occupancy and surface-disturbing activities associated with all 43 oil and gas leases in the Monument, which cover about 42,000 acres.

Overall Management

The Monument will be managed to protect the resources in accordance with the Proclamation, the Federal Land Policy and Management Act, and other applicable provisions of the law. The Proclamation specifically refers to the Monument's archaeological, historical, geological, and biological objects and provides for the proper care and management of the objects to be protected.

How will the Monument be managed to provide conservation principles that will not allow development or uses that defeat the protective purpose of the designation?

How will the Monument be managed to maintain the area as it is today for future generations?

How will the Monument be managed to provide for traditional uses while ensuring the long-term health and viability of the area?

How will the Monument be managed to preserve the wild and undeveloped character?

How will development in the Monument be managed to maintain the primitive qualities of the area?

How will the Monument be managed to protect the natural values and wild character while allowing controlled use?

What will be the impacts on the objects for which the Monument was created given allocations proposed in any potential alternative?

Private and Commercial Recreation Use

Recreational activities occur throughout the area and include motorized and non-motorized touring, big and small game hunting, backpacking, horseback riding, sightseeing, pleasure driving, and river floating.

Commercial guides and outfitters provide services for some recreational activities, such as hunting and river floating. Increased visitation has led to increased demands for visitor services and requests for outfitter permits.

What range of recreational opportunities (vehicle touring, mountain biking, backpacking, car camping, horseback riding, boating/floating, etc.) should be provided to meet the wide variety of public demands (healthy physical pursuits, needs for solitude, etc.) while protecting and preserving the natural, historic, and primitive values of the Monument?

What BLM actions are needed to provide these opportunities in ways that ensure the experiences and benefits visitors desire while protecting the natural resources in the Monument?

How will the management plan determine the location, distribution, signing, advertising, and use of dispersed camping areas along the river and in the uplands?

Are motorized watercraft impacting the physical conditions on the river and the solitude floaters come to enjoy, and to what extent should motorized watercraft be allowed?

How will the existing guide and outfitter use, both on the river and in the uplands, be managed in the future to ensure compliance with Monument objectives and improve public service in the Monument while ensuring equitable access to recreation opportunities for all users?

Should opportunities be provided for one-day trips in the White Cliffs section of the river?

What methods and criteria will be used to determine the appropriate levels of use or carrying capacity limits for all types of private and commercial recreation use in the Monument? Is an allocation or permit system needed on the river to protect

resources and limit social and physical impacts? If so, how will a permit system be developed that is equitable to all users? Is a designated campsite requirement needed to manage physical and social visitor use impacts? Is a group size limitation needed on the river, and if so, what is the appropriate size?

What criteria will be used to determine if new commercial uses, such as vending permits, should be allowed, where they should be allowed, and to what extent?

If recreation uses need to be more restrictively managed, what types of regulations would be implemented, when, and where, and how would they be administered and enforced?

How will conflicts between recreation visitors and other traditional users (grazing permittees, hunters, surrounding private land owners, etc.) be handled in order to eliminate or reduce these conflicts?

To what extent should recreation user fees be implemented within the Monument?

Off-Highway Vehicle Management

Off-highway vehicle use in the Monument has increased over the last few years and is becoming a focus of concern for BLM managers, interest groups, and the general public. The Proclamation states, "For the purpose of protecting the objects identified above, the Secretary shall prohibit all motorized and mechanized vehicle use off road, except for emergency or authorized administrative purposes."

What criteria will be used to determine roads and trails that are open for OHV use or roads and trails that need to be closed and reclaimed?

What routes are available for motorized and mechanical vehicle use, if any? What routes are available for only motorized or mechanized use? For example, are there routes that should remain open for mountain bike use only?

What are the needs and opportunities for special transportation and access development, such as backcountry byways, disabled access routes, horse trails, overlooks, etc.?

Livestock Grazing Management

Many existing laws and regulations govern grazing on public land. In 1997, the Secretary of the Interior approved new Standards for Rangeland Health and Guidelines for Livestock Grazing Management, which apply to all BLM lands in Montana. The Proclamation states, "Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the Monument." Grazing uses in the Monument must be managed in compliance with these laws, regulations, and standards.

How will livestock grazing be managed and improvements maintained or constructed throughout the Monument in order to be sensitive to the needs of the livestock/agriculture industry, result in as little impact as possible to the Monument's resources, and be in compliance with grazing regulations and standards?

Considerations in looking at livestock grazing management include the potential alteration of natural vegetation communities, recreation/grazing conflicts, riparian area management, range improvements/ treatments/maintenance, and socio-economic impacts on permittees.

Oil and Gas and Valid Existing Rights

Subject to valid existing rights, the Monument lands under the Proclamation are "appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the Monument." The 42,805 acres of federal minerals in the Monument in southern Blaine County and northern Fergus County that were leased for oil and gas exploration and development prior to the Proclamation shall remain open to such activities. The oil and gas development is to be managed ". . . subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by this proclamation."

How will the subject of valid existing rights be addressed in the plan? What is the energy resource within the Monument?

What level of development is necessary to promote conservation of oil and gas resources, comply with the requirements of the Proclamation, honor valid existing rights, and protect against drainage?

What conditions of approval are necessary on oil and gas exploration and development to protect the Monument's resources (e.g., wildlife, wildlife habitat, water quality, air quality, and soils) while not at a level with so many restrictions that lease operations are basically uneconomical?

Will a different approach be taken for managing oil and gas activity within the Monument versus how oil and gas activity is managed outside the Monument?

What indicators or units of measure will the BLM use to determine if oil and gas operations interfere with the proper care and management of the Monument?

Fuel Wood and Vegetative Use Permits

The State Director's Interim Guidance for managing the Monument states it is not the BLM's intent to conduct forest sales within the Monument. However, areas for forest products could be identified at the BLM's discretion, as long as the resources for which the Monument was established are not adversely impacted. Also, before these products are lost to prescribed fire or mechanically cleared for fuel reduction, the BLM may consider a forest product sale. The harvesting of all woodland products would be fully analyzed in the plan for compliance with Monument management goals and objectives.

What criteria will be used to determine if the harvesting of vegetative products, such as Christmas trees/boughs, posts/poles, saw logs, native plant seed, medicinal plants, berries, etc. is compatible with Monument management objectives?

If determined compatible with Monument management objectives, where and at what level of use would the harvesting of woodland products be allowed?

Utility Corridors, Rights-of-Way, and Withdrawals

Seven right-of-way corridors in the Upper Missouri National Wild and Scenic River were identified in the West HiLine RMP. New applications for rights-of-way would be processed pursuant to existing policies and practices, valid existing rights, and as necessary for access to private or state lands.

What areas within the Monument should be identified as suitable for right-of-way routes for major utilities and roads?

How will increased demands for energy and communication rights-of-way be accommodated within the Monument?

What mitigation measures, or terms and conditions, would be appropriate for lands that are suitable for right-of-way routes?

Land Tenure Adjustments

As stated in the Proclamation, no BLM land in the Monument will be disposed of other than by exchange with willing private landowners, which would be done only when necessary to further the protective purposes of the Monument, to block up BLM land within the Monument, and to enhance the values for which the Monument was designated.

What criteria should be applied when considering acquisition of non-federal lands to be added to the Monument?

Relationship with In-Holdings

The Proclamation designating the Monument applies only to BLM land. Approximately 82,000 acres of private land are intermingled with the Monument.

What management actions are necessary to ensure access to private land?

What limitations, if any, are necessary to protect Monument resources from impacts of private land access?

Indian Reservations

The Monument does not border any American Indian Reservation. However, the Monument does border American Indian lands outside the boundary of the Fort Belknap Indian Reservation.

What management actions are necessary to provide for consistent management activities that recognize values and uses on adjoining American Indian lands?

Issue 2: What facilities and infrastructure are appropriate to provide visitor interpretation and administration of the Monument?

The planning area is characterized as a predominantly natural environment with few facilities, other than along the UMNWSR, for the comfort and convenience of visitors. Currently, the BLM has a visitor contact station and an office located in Fort Benton, and a variety of recreation sites along the UMNWSR. Additional facilities may be needed for visitor safety and information, disabled access, and to address human sanitation, vehicle use and other resource uses and impacts.

What level of visitor services is compatible with the Monument resources and purpose?

To what extent, degree, and where are additional visitor facilities needed such as trails, restrooms, interpretive areas, campgrounds, public drinking water, waste disposal, and parking areas? Should existing facilities be removed or modified for compatibility with Monument goals?

What level of development, choice of standards, consistency, and kind of maintenance would be required for existing or proposed visitor facilities, including signing?

Issue 3: How will BLM manage biological, historical, cultural, and visual values of the Monument?

Various ways of protecting resources include enforcing existing laws and regulations, educating visitors, managing access, setting management and research priorities, suppressing wildfires and managing fuels, restoring degraded ecological conditions, or some combination of these approaches.

Some of the Monument's major resources for which management decisions must be made by the BLM include cultural, recreation, riparian communities, vegetation and water resources, as well as biodiversity and wildlife habitat.

Cultural and Historical Values

The Monument contains a complex landscape and remarkable cultural and historical values ranging from old homesteads and steamboat graffiti, to buffalo jumps and teepee rings.

How can the traditional ranching history of the area be integrated into management of the Monument?

Where and how will interpretation be used as an education tool to increase the public awareness and appreciation of the Monument's cultural and historical resources while not diminishing the integrity and experience of visiting the location, or the setting being compromised by developed recreation, noise, and excess visitation?

What criteria will be used to determine if stabilization/preservation of features/structures is appropriate (cost vs. benefit or value or feature)?

What, if any, are the future research needs for the Monument?

What areas need additional inventory and evaluation for cultural and historical resources?

What role will partnerships play in site stewardship, stabilization, and interpretation of the cultural and historical features within the Monument?

Wildlife and Fisheries Habitat

Monument lands provide habitat for a variety of wildlife species. Increased use throughout the Monument, including recreation use and motorized vehicle use, requires careful planning to integrate habitat management with other resource programs in order to minimize impacts to wildlife species and their habitats.

What level of animal damage control will be permitted, in what manner, and where?

How will beaver be managed to maintain riparian areas?

How will human activities that result in wildlife displacement be managed?

What information will be needed (e.g., crucial habitat, corridors, indicator species) to adequately assess wildlife habitat and develop management actions to improve or restore habitat conditions?

How will biodiversity in wildlife communities be maintained or restored?

How will prairie dog towns be managed in the Monument?

How will sage grouse habitat be managed in the Monument?

How will the management plan address threatened or endangered species, including recovery areas in the Monument? How will human activities or uses be managed to provide for the recovery of threatened or endangered species and species of special concern?

Vegetation

Vegetation provides food and cover for wildlife and domestic animals and scenic enjoyment for people. It is a key ingredient in determining the health of public land because it influences the quantity of water produced from area watersheds and affects overland flows and soil movement, which lead to erosion and loss of habitat. Non-native plants and noxious weeds displace native species, affect the structure of plant associations and their ecological function, and threaten biodiversity.

What are the desired conditions of the vegetation types in the Monument?

How will biodiversity in vegetation and associated communities be maintained or restored?

How will the BLM landscape health standards be achieved and to what extent will land use activities be modified to meet these standards?

How will the management plan address the erosion of sites and how will this be considered in any project development?

How should noxious and invasive plants be managed in the Monument? Which non-native plants are invasive or noxious? What can be done to manage noxious weeds and restore native plants? What prevention activities can be developed and implemented in the Monument to control the influx of undesirable plants and noxious weeds?

Riparian and Water Resources

Riparian areas attract and concentrate populations of area mammals, birds, reptiles, and amphibians; provide habitat for diverse vegetation communities not found elsewhere in the area; and help protect water quality by filtering sediments and protecting banks from erosion. Riparian areas, however, are affected by intensive recreation use, removal of natural vegetation, beavers, livestock grazing/trampling, and other surface disturbances. All of these influences can cause bank disturbance, destabilization of stream channels, increased erosion and siltation, disruption to riparian-dependent plants and wildlife, and degradation of water quality.

How will Monument riparian communities be protected and cottonwood stands regenerated, and how will this affect land uses?

What measures must be taken to ensure that the highest quality water standards are maintained throughout the Monument?

How is the Monument going to affect my existing water rights?

How will the exercise of private water rights affect Monument purposes?

Fire Management

Fire could be a positive influence in much of this area and help restore natural fire regimes. However, fire occurrence in certain areas of heavy fuel loading (such as timbered coulees) and areas of heavy brush and grass growth could threaten improvements and structures in the Monument area. High-intensity fires can also threaten wildlife values and the desired condition of vegetation and riparian areas.

In order to protect Monument values, does a fire management plan need to be developed specifically for the Monument? What level of fire protection is needed in the Monument?

For what purposes, and how, will fire be used as a management tool in the Monument? For example, will fire be used to help reduce hazardous fuel loads? Where are the hazardous fuels within the Monument? Should fire be allowed to take its natural role in the environment? How will the management plan consider fire risk, hazards, and mitigation?

What is the public perception of suppression philosophy and the impacts, such as smoke, to the Monument and surrounding communities?

What alternative methods for treating hazardous fuels will be permitted within the Monument?

How will wildland and prescribed fire be managed to enhance fire-adapted ecosystems and restore natural fire regimes?

Issue 4: How will Monument management be integrated with other agency and community plans?

The BLM has a strong commitment to work with other agencies and communities in managing the Monument. Coordination with state agencies that have jurisdiction over resources within the Monument is essential for effective management. These agencies include Montana Fish, Wildlife & Parks, and the Montana Department of Natural Resources and Conservation.

Monument objectives call for a significant portion of visitor services related to the Monument to be located in the surrounding communities rather than within the Monument. In order to do this, a good working relationship with local tourism and service providers must be developed and maintained. Agreements with the local counties and communities for coordinating activities and needs such as planning, transportation, emergency services (i.e., search and rescue), law enforcement, infrastructure and tourism need to be explored.

County Land Use Plans

The BLM shall, to the extent practical, keep apprised of local land use plans, and assure that consideration is given to those local land use plans.

What management actions in the Monument conflict with county ordinances, or are needed to make actions consistent?

How will county road designations and increased levels of use be dealt with in the Monument plan?

Emergency Services (Blaine, Chouteau, Fergus and Phillips County Sheriffs)

The Blaine, Chouteau, Fergus and Phillips County Sheriffs' Departments conduct emergency services in the Monument. The BLM assists as requested with available resources. Assistance requests are made through the Field Staff Ranger in the Lewistown Field Office. The following questions will need to be answered in the plan to arrive at a single, coordinated and effective approach to handle these activities.

What criteria will best determine when an emergency situation warrants the impacting of Monument values in order to properly deal with emergencies such as fires, emergency evacuations, law enforcement activities, deceased persons, or aircraft accidents/investigation?

What is the simplest process for considering and approving or rejecting requests for these activities anywhere in the Monument, assuming by their nature that the activities require a quick response from someone in authority?

What will be required, if anything, to establish or maintain cooperative relations with the County Sheriffs' Departments relative to these activities?

Are restrictions needed to protect Monument values? How will the additional risk of human-caused fires brought on by increased visitor use be managed?

Tourism Management

Monument objectives call for a significant portion of visitor services related to the Monument to be located in the surrounding communities rather than within the Monument.

How can the BLM best work with the tourism industry, local businesses, etc., to ensure that visitors to the Monument are provided with the right information about the Monument and the activities it offers?

How will tourism be managed to prevent degradation of the resources for which the Monument was designated?

What tools/sources such as interpretation and advertising need to be utilized on local, regional, and national levels for information and education about the Monument?

What messages about the Monument need to be conveyed?

How will the BLM incorporate visitor and local preferences into Monument management?

U.S. Fish and Wildlife Service Consultation

The Endangered Species Act, Section 7 Programmatic Consultation and Coordination will be conducted as necessary during plan development.

Early interagency communication, coordination, consultation and conferencing on candidate, proposed, and listed species will take place prior to and during plan development.

Issue 5: How will transportation and access be managed?

A network of local, collector and resource roads currently provides access to many areas of the Monument. County roads are routinely graded and maintained by Blaine, Chouteau, Fergus and Phillips Counties, while BLM-managed routes receive various levels of maintenance based on a BLM maintenance schedule.

What roads and trails should the BLM provide for access to or across public land in the planning area? How will the need for state and private land access be addressed in the plan? How will access be managed where select persons have access to public resources and the general public does not; and how will specific means of access be accommodated?

Are the current roads adequate or do they need to be modified to increase protection for Monument resources, reduce user conflicts, and/or provide better travel opportunities for Monument users? How should management of roads accommodate the elderly and disabled? How should the need for new road construction and maintenance be addressed in the plan?

How many and what type of motorized travel routes are needed on public land in the Monument, and what type of vehicle restrictions, if any? Is it necessary to distinguish between upland use and river access needs?

What roads and trail easements should be acquired to provide reasonable public and administrative access to the Monument lands?

What roads and trails in the Monument should be closed and/or rehabilitated to protect resources, or eliminate or reduce use conflicts?

How should aircraft be managed in the Monument? Is there a need for designated landing strips or areas, and what level of standard and maintenance should be attached to airstrips? How will BLM interact with airspace managers to provide for or influence direction of air traffic compatible with Monument goals?

Issue 6: How will Monument management affect economic and social conditions in the area?

The Monument can provide tourism, hunting, and other forms of recreation while bolstering the economy of Montana. Monument management must recognize the continuation of existing land ownership and the economic activities that are dependent on the land and its natural resources.

What is the effect on the overall economy and local culture if a shift is made from production of products from the public land to other emphasis areas?

How will the management plan consider decisions affecting agriculture that have a far-reaching impact?

Recreational developments, including visitor services and interpretive facilities, should be placed in gateway communities.

An economic analysis should be prepared of any extractive development and ground-disturbing activities.

An economic analysis should be prepared of any extractive development and ground- disturbing activities and should disclose to what degree the activities are below cost.

Preservation of the ranching culture is important.

APPENDIX F
Issues Considered but Not Analyzed Further

Current management, BLM policy, or administrative action can address some of the issues raised during the scoping process. Other issues are beyond the scope of the RMP and cannot be addressed. These issues are discussed below.

How will Monument resources be managed to maintain the area as a Class 1 airshed?

The State of Montana has delegated responsibility for management of the Clean Air Act, including classification of airsheds. The Monument is within airshed 9 and is a Class 2 airshed. The BLM will comply with national and state air quality standards.

How will management consider water quality and water rights on the Missouri River and its tributaries?

Surface and groundwater quality must be maintained to meet or exceed state and federal water quality standards. Montana water laws govern water rights. BLM policy and current laws address this issue.

Livestock are adversely impacting riparian and upland health.

The Proclamation affirms that "Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the Monument." The Standards for Rangeland Health and Guidelines for Livestock Grazing Management were established in 1997, and apply to all BLM land in northcentral Montana, including the Monument. Standard No. 1 established the indicators for healthy upland areas that contribute to proper functioning conditions in the uplands. Standard No. 2 established the indictors for healthy riparian areas that contribute to proper functioning conditions in riparian and wetland areas. In addition, grazing management guidelines specifically emphasize management practices that would maintain and/or improve rangeland health.

The watershed planning and grazing permit/lease renewal process assessed the impact of livestock grazing on the Standards for Rangeland Health, as well as other resource management goals. Part of the assessment process included reviewing allotments for their suitability for grazing, stocking levels, seasons of use, duration of grazing and other grazing management practices and their impact on other resources. When livestock grazing was identified as a cause for not meeting standards or resource management goals, corrective actions were identified. The results of standards assessments and the corresponding corrective actions can be found in the watershed plans. Not all implementation actions occur immediately because of funding and resources available. Through ongoing monitoring and management strategies, implementation is continuing. Grazing management is discussed further in Chapters 2 and 3 under Vegetation – Native Plants and Vegetation – Riparian.

Will forage be properly allocated between livestock and wildlife?

Forage allocation to various uses in the Monument area was analyzed in the Missouri Breaks EIS in 1979. Since 1979, the West HiLine RMP and Judith-Valley-Phillips RMP brought forward these allocations. All activity planning and implementation efforts stipulate that ongoing monitoring will be used as a basis to adjust allocations, and the adjustments are made on a periodic basis as the need has been (and will be) apparent. (Activity planning includes watershed plans, allotment management plans, habitat management plans, etc.)

Range improvements must be maintained or upland health will suffer. Lack of access to range improvements will make management of grazing difficult.

Maintenance of and access to range improvements is an ongoing process consistent with completed watershed plans and BLM policy.

Livestock grazing is negatively impacting wildlife habitat.

When livestock grazing is identified as the cause of not meeting standards (particularly Standard #5 dealing with habitat), existing regulations and policy are in place to make necessary adjustments. All activity planning and implementation efforts stipulate that ongoing monitoring will be used as a basis to adjust allocations, and the adjustments are made on a periodic basis as the need has been (and will be) apparent. (Activity planning includes watershed plans, allotment management plans, habitat management plans, etc.)

To what extent will mining be allowed in the Monument?

If mining claims are tested and found to be valid, the claimants would be considered to have valid and existing rights. If mining claims are tested and found to be invalid, the claims would be terminated. Per the Proclamation, no new mining claims could be accepted.

To what extent should the BLM administer filming permits?

The administration of filming permits is addressed by current policy (IM MT-098-063).

How does the BLM decide what constitutes a road?

A road is a linear route segment that can be created by the passage of vehicles (two-track); constructed; improved; or maintained for motorized travel. Roads are classified as collector roads, local roads, or resource roads as defined in BLM Manual 9113. This issue is currently addressed by BLM policy.

Management of the Monument needs to recognize the need for adequate funding, including enforcement and interpretation activities. Does the BLM have the capability to implement a management plan for the Monument?

Decisions from an RMP would be implemented over a period of years depending on budget and staff availability. Enforcement and education to protect the values of the Monument will be part of this implementation. Funding levels affect the timing and implementation of management actions and project proposals, but do not affect the decisions made in an RMP. In Fiscal Year 2007, the Monument was managed with a staff of 19 individuals, which includes four seasonal employees, along with support from seven individuals from other BLM offices (this does not include other support services such as procurement, engineering, information resources, fire, etc.). This issue is addressed by BLM policy and budgets during implementation.

WSAs should be protected under the non-impairment mandate and the RMP should establish a program for doing so. WSAs should be managed as wilderness until such time that Congress acts; this includes managing and maintaining WSAs and other potential roadless areas in a pristine condition.

The WSAs within the Monument will be managed based on the Missouri Breaks Wilderness Suitability Study/EIS and consistent with Interim Management Policy and Guidelines for Lands under Wilderness Review (BLM Manual H-8550-1). This issue is currently addressed by BLM policy.

The RMP should outline a specific schedule and timeline for reinventorying all Monument roadless areas with wilderness character, especially Bullwhacker Coulee.

A formal wilderness inventory of this area was completed in 1979 and 1980. The BLM has no information to suggest that this inventory needs revision. The public does have the opportunity to help provide information to the BLM concerning wilderness characteristics and inventory.

How will fires be managed within the Monument, especially those that threaten land or property outside the Monument or private land intermingled with the Monument?

The BLM will fully suppress any fires occurring on BLM land that threaten private land or BLM structures/improvements. This issue is addressed by BLM policy.

How are emergency services going to be provided on the river and how will this affect the local communities that may help provide these services? (Local communities should be reimbursed for the services they provide.) Local community assistance is needed due to increased fire protection workload from increased visitor use. Insufficient dialog exists between the BLM and communities in the Monument area related to fire protection and emergency services.

The Fergus, Chouteau, Blaine and Phillips County Sheriff's Departments conduct emergency services in the Monument. The BLM assists as requested with available resources. Emergency services are guided by BLM policy and administrative action.

The process of management should be open, involve the public, and include compromise. Management of the Monument must recognize local and community participation, the scientific community, and all Americans.

Preparation of the RMP will be consistent with the Federal Land Policy and Management Act (FLPMA) and NEPA, which provide for public involvement. This issue is addressed by law and BLM policy.

Management of the Monument must consider the baseline conditions in the area and the cumulative impacts occurring on adjacent private and BLM land.

The current resource conditions in the Monument and the analysis of effects are guided by the regulations for implementing NEPA. The RMP/EIS will be consistent with current law, regulations, and policy.

Management of the Monument must consider the requirements under existing laws and regulations.

Preparation of the RMP will be consistent with FLPMA and NEPA. This issue is addressed by law, regulations, and BLM policy.

What type of visitors are we to expect?

Management of the Monument will consider what range of recreational opportunities should be provided to meet the wide variety of public demands. The BLM has no control over who may want to visit the Monument.

The Breaks is a place away from the noise and chaos of city/everyday life. Americans need places where they can restore their sanity and this is one of those places. Keep in mind the long-term focus. Society's preferences and needs come and go but only the land can endure.

The management plan will look at the social conditions in the area along with the opportunities provided by the Monument consistent with the Proclamation and how those opportunities affect social wellbeing. This issue is addressed by BLM policy.

How will the quality of the river experience be maintained or improved relative to supersonic flights and sonic booms?

The Monument is located beneath the Hays Military Operations Area (MOA). The Hays MOA overlies a large portion of northcentral Montana at altitudes ranging from 300 feet above ground level, up to 18,000 feet above mean sea level. The Federal Aviation Administration has the responsibility to plan, manage, and control the structure and use of all airspace over the United States, including the Hays MOA. This issue is beyond the scope of the RMP since the BLM has no jurisdiction or authority for this MOA.

Hunting should continue to be used as a management tool and the State of Montana shall retain the authority and responsibility of managing fish and game within the Monument. How will current hunting and trapping uses of BLM land within the Monument be managed in the future?

The Proclamation designating the Monument did not ". . . enlarge or diminish the jurisdiction of the State of Montana with respect to fish and wildlife management." This issue is beyond the scope of the RMP since the BLM does not have the jurisdiction or authority for managing fish and wildlife within the Monument.

What will be the effect on the livestock industry if the recreating public is granted exclusive use of the river corridor?

The Proclamation designating the Monument provided that the area be managed ". . . pursuant to applicable legal authorities, including the National Wild and Scenic Rivers Act . . ." and that "[l]aws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases . . . shall continue to apply." The Upper Missouri was designated a Wild and Scenic River in 1976 with a multiple use mandate, which means the BLM must recognize all the resource uses present (PL 94-486). This issue is beyond the scope of the RMP since the BLM cannot grant exclusive use of the river to the recreating public under PL 94-486 or the Proclamation.

How will private property be protected from the impact of campers?

The Proclamation designating the Monument applies to "all lands and interests in lands owned or controlled by the United States . . . ." This issue is beyond the scope of the RMP since management of the Monument does not apply to private property.

How should the communities near the Monument prosper with management of the Monument?

The BLM has a strong commitment to work with communities in managing the Monument, including activities and needs such as planning, transportation, emergency services, law enforcement, infrastructure, and tourism. However, preparation of specific community economic development plans is beyond the scope of this RMP.

How will the Monument be managed to restore the area to the conditions of the time of Lewis and Clark?

The Proclamation designating the Monument provided that the area be managed ". . . pursuant to applicable legal authorities, including the National Wild and Scenic Rivers Act . . ." and the "establishment of the Monument is subject to valid existing rights." The Upper Missouri was designated a Wild and Scenic River in 1976 with a multiple use mandate, which means the BLM must recognize all the resource uses present (PL 94-486). This issue is beyond the scope of the RMP since the BLM must manage the river under a multiple use mandate as required by PL 94-486 and manage the Monument subject to valid existing rights.

The river's flow needs to correspond to historic floods and lows. The Army Corps of Engineers and Bureau of Reclamation should emulate historic flows via Canyon Ferry Dam and Tiber Dam on the Missouri and Marias Rivers.

This issue is beyond the scope of this RMP since the BLM has no jurisdiction or authority over water flows on the Missouri and Marias Rivers.

Leave private land out of the Monument and let landowners choose for themselves whether to have their land included within the boundaries.

The Proclamation designating the Monument applies to "all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map . . . ." The BLM has no jurisdiction over private land.

What is the BLM's authority to regulate recreational activities on the Upper Missouri National Wild and Scenic River, including recreation user fees and motorized watercraft restrictions?

FLPMA gives the BLM general authority to regulate and enforce the occupancy and use of the public lands through permits and fees (43 USC § 1732 (b), 1733 (1994)). Through 2004, the Land and Water Conservation Fund Act of 1964 empowered the BLM to issue Special Recreation Permits (SRPs) according to its own procedures and fee schedules (16 USC § 460l-6a(c) (1994)). These SRPs help manage group activities, recreation events, motorized recreation vehicle activities, and other special recreation uses in accordance with procedures at fees established by the agency involved.

The Federal Lands Recreation Enhancement Act (FLREA) of 2004 gives the Secretary of the Interior authority to issue SRPs and charge fees connected to issuing those permits. This authority began in 2005, and applies to group activities, recreation events and motorized vehicle use activities on federal recreational lands and waters. This act replaces the BLM authority to charge fees under the Land and Water Conservation Fund Act.

Bureau regulations (43 CFR 2930) require SRPs for all commercial uses on the public lands and waters that the BLM manages, including permits for any uses in special areas such as wild and scenic rivers. The BLM can manage, require and enforce permits and fees within a wild and scenic river to protect the river values, even if the river users do not set foot upon BLM land (63 IBLA at 381-82). Management activities and enforcement are designed to protect public lands, property, users, occupants, resources, and activities on or having a clear potential to affect lands adjacent to BLM land or related waters.

The BLM should consider designating new areas of critical environmental concern in the Monument.

During scoping for the Monument RMP one potential ACEC nomination was received for greater sage-grouse habitat. When asked for further clarification on this nomination, the nominator withdrew this nomination from further consideration. No other areas were nominated for ACEC consideration.

APPENDIX G
Vision and Management Goals

Vision

The BLM will manage the Monument in a manner that maintains and protects its biological, geological, visual and historic objects and preserves its remote and scenic character. The management plan will incorporate the Proclamation, multiple use, and existing laws, while recognizing valid existing rights and authorizations and providing diverse recreational opportunities.

Management Goals

A number of goals will guide the development of alternatives for the resource management plan. These goals are the result of information provided through public scoping, existing laws and regulations, the Proclamation, and the planning team.

Goal 1: Manage visitor use and services on these BLM lands in a manner that protects Monument values and resources. This goal would allow the BLM to:

- Preserve historic and cultural values and sites by enhancing public awareness or protection of the resources;
- Protect and preserve the wild and scenic character of the river and preserve or enhance the primitive characteristics of the wilderness study areas;
- Protect the cultural landscape (viewshed) and the visual features in the landscape that are identified in the Proclamation;
- Protect significant paleontological resources;
- Inform visitors of the differences between private property and BLM land;
- Control wildland fire safely, efficiently and with minimal impact to resource values; and
- Provide for visitor health and safety at levels appropriate to the risks normally expected when engaged in recreational activities in the Monument.

Goal 2: Manage these BLM lands in a multiple use manner consistent with the Proclamation and all current law and policy.

Goal 3: Manage legal and physical access to and within the Monument to provide opportunities for diverse activities. This goal would allow the BLM to:

- Provide access to state and federal land while protecting the features of the Monument;
- Provide access for diverse recreation opportunities;
- Allow access for emergency services (firefighting, search and rescue, etc.);
- Provide reasonable access for private landowners; and
- Allow access for administrative needs and authorized uses of industry and government agencies.

Goal 4: Manage these BLM lands for a variety of sustainable visitor experiences in mostly primitive and natural landscapes. This goal would allow the BLM to:

- Provide for dispersed and developed recreation opportunities and ensure visual quality characteristics reflect a predominantly primitive or natural landscape; and
- Provide for a diversity of visitor experiences.

Goal 5: Manage these BLM lands in a manner that provides a healthy ecosystem supporting plant and animal species and achieves a sustainable variation of native vegetation communities. This goal would allow the BLM to:

- Manage, enhance and protect the fish and wildlife habitat and special status species;
- Achieve, or make significant progress toward, proper functioning condition in riparian areas;
- Manage for healthy vegetation communities that provide for a wide variety of long-term benefits such as aesthetics, wildlife, recreation, livestock grazing, etc;
- Maintain or re-establish the natural influence of fire on vegetation communities;

- Control, contain and, if possible, eradicate invasive plants;

- Maintain and/or improve the existing hydrologic systems in the Monument; and

- Maintain the air quality in the Monument.

Goal 6: Manage these BLM lands in a manner that provides current and future generations with the social and economic benefits compatible with the Proclamation. This goal would allow the BLM to:

- Provide a diverse array of stable economic opportunities in an environmentally sound manner, including the exploration and development of existing oil and gas leases;

- Provide quality opportunities to meet the demands of various publics for all resources, and a diverse array of activities that result in social benefits while minimizing negative social effects; and

- Minimize the risk of catastrophic fire within the Monument and communities adjacent to the Monument.

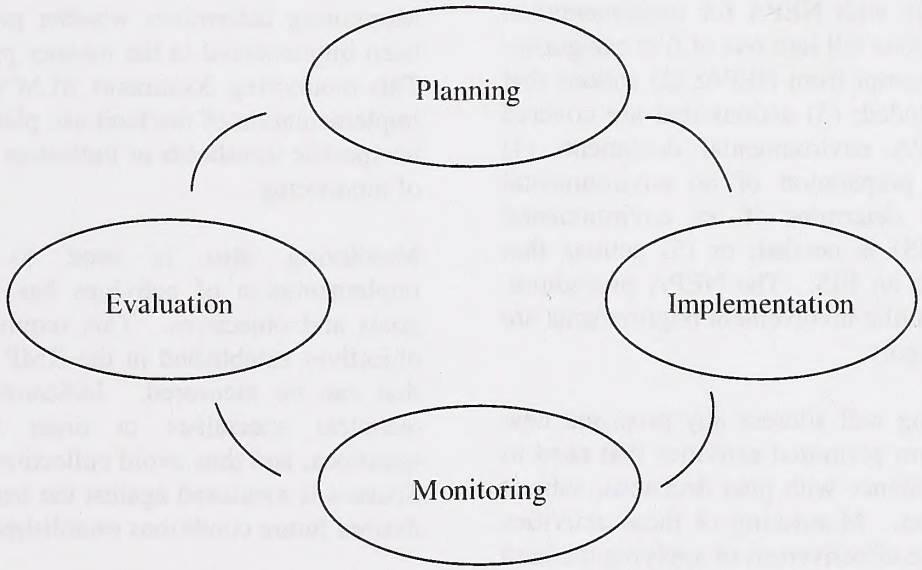
Goal 7: Manage these BLM lands in a manner that involves the public and collaborating agencies (local, state, federal and tribal) at every opportunity. This goal would allow the BLM to:

- Continue recognizing distinct local values (local communities, users, and private landowners) while continuing to recognize national interests.

APPENDIX H
Implementation and Monitoring

Plan implementation is a continuous process occurring over the life of the resource management plan that will consider changing circumstances and new information through monitoring. The goal is to maintain a dynamic resource management plan that is evaluated and amended if necessary on an issue-by-issue basis.

The implementation and monitoring process for the Monument involves four major steps: planning, implementation, monitoring, evaluation, and adjustments, as necessary. Planning involves a great amount of time and resources to identify issues and management opportunities to address those issues. During the planning process, the scope of the issue is identified and management goals, objectives and actions are defined to address the issues. Once the planning process is completed, decisions are implemented, monitored, and evaluated over a period of time to determine if goals are being met and if management actions are achieving the desired objective or standard. Results of monitoring are documented and communicated to appropriate parties, and management objectives and actions are modified based on results, if necessary.



Planning

The Proposed RMP/Final EIS is approved once the Record of Decision is signed. An Approved Plan will also be available that will include all the approved decisions from the RMP.

The BLM regulation in 43 CFR 1610.5-4 provides that land use plan decisions and supporting components can be maintained to reflect minor changes in data. Maintenance is limited to further refining, documenting, or clarifying a previously approved decision incorporated in the plan. Maintenance must not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the Approved Plan.

Land use plan decisions are changed through either a plan amendment or a plan revision. The process for conducting plan amendments is basically the same as the land use planning process used in developing RMPs. The primary difference is that circumstances may allow for completing a plan amendment through the environmental assessment (EA) process, rather than through an EIS. Plan amendments (43 CFR 1610.5-5) change one or more of the terms, conditions, or decisions of an approved land use plan. Plan amendments are most often prompted by the need to consider a proposal or action that does not conform to the plan; implement new or revised policy that changes land use plan decisions; respond to new, intensified, or changed uses on BLM land; and consider significant new information from resource assessments, monitoring, or scientific studies that change land use plan decisions.

Implementation

Implementation of the resource management plan (RMP) begins once the Record of Decision and Approved Plan for the Proposed RMP/Final EIS is signed.

Decisions made through the RMP planning process are implemented over a period of time. Some of the decisions are immediate and go into effect with the Record of Decision. These include decisions such as the road designations and lands available for disposal through exchange. Some decisions would be implemented after a site-specific environmental review is completed. Examples include range improvements, recreation sites, or approval of an application for permit to drill a natural gas well. Other decisions include guidance that would be applied during site-specific analysis or activity planning.

Any future proposals or management actions will be reviewed against the Approved Plan to determine if the proposal would be in conformance with the RMP. While the Final EIS for the Monument RMP provides the compliance with NEPA for the broad-scale decisions to be made in the Record of Decision, it does not replace the requirement to comply with NEPA for implementation actions. Proposed actions fall into one of five categories: (1) actions that are exempt from NEPA; (2) actions that are categorically excluded; (3) actions that are covered by an existing NEPA environmental document; (4) actions that require preparation of an environmental assessment (EA) to determine if an environmental impact statement (EIS) is needed; or (5) actions that require preparation of an EIS. The NEPA procedural, documentation, and public involvement requirements are different for each category.

Activity level planning will address any proposed new activities and long-term permitted activities that need to be brought into compliance with plan decisions, subject to valid existing rights. Monitoring of these activities will then determine the effectiveness of applying the land use plan direction. Where land use plan actions or best management practices are not effective, modifications could occur without amendment or revision of the plan as long as assumptions and impacts disclosed in the analysis remain valid and broad-scale goals and objectives are not changed. This approach uses on-the-ground monitoring, review of scientific information, and consideration of practical experience and common sense to adjust management and modify implementation of the plan to reach the desired outcome.

As part of this process, the BLM will review management actions and the plan periodically to determine whether the objectives set forth in this document are being met. Where they are not being met, the BLM will consider adjustments of appropriate scope. Where the BLM considers taking or approving actions which will alter or not conform to overall direction of the plan, the BLM will prepare a plan amendment and environmental analysis of appropriate scope.

In addition, during the life of the Approved Plan, the BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data or support new management techniques, best management practices, and scientific principles. To the extent that such new information or actions address issues covered in the plan, the BLM will integrate the data through plan maintenance.

Monitoring

Monitoring is the repeated measurement of activities and conditions over time. Monitoring data gathered over time is examined and used to draw conclusions on whether management actions are meeting stated objectives, and if not, why. Conclusions are then used to make recommendations on whether to continue current management or what changes need to be made in management practices to meet objectives.

Monitoring determines whether planned activities have been implemented in the manner prescribed by the plan. This monitoring documents BLM's progress toward full implementation of the land use plan decision. There are no specific thresholds or indicators required for this type of monitoring.

Monitoring also is used to determine if the implementation of activities has achieved the desired goals and objectives. This requires knowledge of the objectives established in the RMP as well as indicators that can be measured. Indicators are established by technical specialists in order to address specific questions, and thus avoid collection of unnecessary data. Success is measured against the benchmark of achieving desired future conditions established by the plan.

Monitoring is also used to ascertain whether a cause-and-effect relationship exists among management activities or resources being managed. It confirms whether the predicted results occurred and if assumptions and models used to develop the plan are correct. This type of monitoring is often done by contract with another agency, academic institution, or other entity, and is usually expensive and time consuming since results are not known for many years.

Regulations at 43 CFR 1610.4-9 require that the proposed plan establish intervals and standards, as appropriate, for monitoring and evaluation of the plan, based on the sensitivity of the resource decisions involved. Progress in meeting the plan objectives and adherence to the management framework established by the plan is reviewed periodically. CEQ regulations implementing NEPA state that agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases (40 CFR 1505.2(c)). To meet these requirements, the BLM will prepare periodic reports on the implementation of the RMP.

Evaluation

Evaluation is a process in which the plan and monitoring data are reviewed to see if management goals and objectives are being met and if management direction is sound.

Land use plan evaluations will be used by BLM to determine if the decisions in the RMP, supported by the accompanying NEPA analysis, are still valid. Evaluation of the RMP will generally be conducted every five years, unless unexpected actions, new information, or significant changes in other plans, legislation, or litigation triggers an evaluation. Land use plan evaluations determine if decisions are being implemented, whether mitigation measures are satisfactory, whether there are significant changes in the related plans of other entities, whether there is new data of significance to the plan, and if decisions should be changed through amendment or revision.

Based on a Record of Decision and Approved Plan released in the fall or winter of 2007, the following evaluation schedule would be followed for the Monument RMP/EIS:

- January 2013
- January 2018
- January 2023
- January 2028

Evaluations will follow the protocols established by the BLM Land Use Planning Handbook H-1601-1 in effect at the time the evaluation is initiated.

APPENDIX I
Federal and Montana Ambient Air Quality Standards

Pollutant	*Time Period*	*Federal (NAAQS)*	*Montana (MAAQS)*	*Standard Type*
Carbon Monoxide	Hourly Average	35 ppm	23 ppm	Primary
	8-Hour Average	9 ppm	9 ppm	Primary
Fluoride in Forage	Monthly Average	- -	50 µg/g	- -
	Grazing Season	- -	35 µg/g	- -
Hydrogen Sulfide	Hourly Average	- -	0.05 ppm	- -
Lead	90-Day Average	- -	1.5 µg/m³	- -
	Quarterly Average	1.5 µg/m³	- -	Primary and Secondary
Nitrogen Dioxide	Hourly Average	- -	0.30 ppm	- -
	Annual Average	0.053 ppm	0.05 ppm	Primary and Secondary
Ozone	Hourly Average	0.12 ppm	0.10 ppm	Primary and Secondary
	8-Hour Average	0.08 ppm	- -	Primary and Secondary
Particulate Matter (PM_{10})	24-Hour Average	150 µg/m³	150 µg/m³	Primary and Secondary
	Annual Average	50 µg/m³	50 µg/m³	Primary and Secondary
Particulate Matter ($PM_{2.5}$)	24-Hour Average	65 µg/m³	- -	Primary and Secondary
	Annual Average	15 µg/m³	- -	Primary and Secondary
Settleable Particulate	30-Day Average	- -	10 g/m	- -
Sulfur Dioxide	Hourly Average	- -	0.50 ppm	- -
	3-Hour Average	0.50 ppm	- -	Secondary
	24-Hour Average	0.14 ppm	0.10 ppm	Primary
	Annual Average	0.03 ppm	0.02 ppm	Primary
Visibility	Annual Average	- -	3×10^{-5} /m	- -

APPENDIX J
Standards for Rangeland Health
and
Guidelines for Livestock Grazing Management

Standards for Rangeland Health

Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Achieving or making significant and measurable progress towards these functions and conditions is required of all uses of public rangelands. Historical data, when available, should be used when assessing progress towards these standards.

Standard #1: Uplands are in proper functioning condition.

This means that soils are stable and provide for capture, storage and safe release of water appropriate to soil type, climate and landform. The amount and distribution of ground cover (i.e., litter, live and standing dead vegetation, microbiotic crusts, and rock/gravel) for identified ecological site(s) or soil-plant associations are appropriate for soil stability.

Evidence of accelerated erosion in the form of rills and/or gullies, erosional pedestals, flow patterns, physical soil crusts/surface scaling and compaction layers below the soil surface is minimal. Ecological processes including hydrologic cycle, nutrient cycle and energy flow are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential and there is a diversity of species characteristic of and appropriate to the site. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

Physical Environment

- erosional flow patterns
- surface litter
- soil movement by water and wind
- soil crusting and surface sealing
- compaction layer
- rills
- gullies
- cover amount
- cover distribution

Biotic Environment

- community richness
- community structure
- exotic plants
- plant status
- seed production
- recruitment
- nutrient cycle

Standard #2: Riparian and wetland areas are in proper functioning condition.

This means that the functioning condition of riparian-wetland areas is a result of the interaction among geology, soil, water and vegetation. Riparian-wetland areas are functioning properly when adequate vegetation, landform or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood water retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for native fish production, waterfowl breeding, and other uses appropriate for the area that will support greater species richness.

The riparian-wetland vegetation is a mosaic of species richness and community structure serving to control erosion, shade water, provide thermal protection, filter sediment, aid floodplain development, dissipate energy, delay flood water, and increase recharge of groundwater where appropriate to landform. The stream channels and flood plain dissipate energy of high water flows and transport sediment appropriate for the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity), climate, and landform. Soils support appropriate riparian-wetland vegetation, allowing water movement, filtering sediment, and slowing ground water movement for later release. Stream channels are not entrenching beyond natural climatic variations and water levels maintain appropriate riparian-wetland species.

Riparian areas are defined as land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

Hydrologic

- floodplain inundated in relatively frequent events (1-3 years)
- amount of altered streambanks
- sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
- upland watershed not contributing to riparian degradation

Erosion/Deposition

- floodplain and channel characteristics; i.e., rocks, coarse and/or woody debris adequate to dissipate energy
- point bars are being created and older point bars are being vegetated
- lateral stream movement is associated with natural sinuosity
- system is vertically stable
- stream is in balance with water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Vegetation

- reproduction and diverse age class of vegetation
- diverse composition of vegetation
- species present indicate maintenance of riparian soil moisture characteristics
- streambank vegetation is comprised of those plants or plant communities that have deep binding root masses capable of withstanding high streamflow events
- utilization of trees and shrubs
- riparian plants exhibit high vigor
- adequate vegetative cover present to protect banks and dissipate energy during high flows
- where appropriate, plant communities in the riparian area are an adequate source of woody debris

Standard #3: Water quality meets Montana State standards.

This means that surface and ground water on public lands fully support designated beneficial uses described in the Montana Water Quality Standards. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

- dissolved oxygen concentration
- pH
- turbidity
- temperature
- fecal coliform
- sediment
- color
- toxins
- others: ammonia, barium, boron, chlorides, chromium, cyanide, endosulfan, lindane, nitrates, phenols, phosphorus, sodium, sulfates, etc.

Standard #4: Air quality meets Montana State standards.

This means that air quality on public lands helps meet the goals set out in the State of Montana Air Quality Implementation Plan. Efforts will be made to limit unnecessary emissions from existing and new point or non-point sources.

The BLM management actions or use authorizations do not contribute to air pollution that violates the quantitative or narrative Montana Air Quality Standards or contributes to deterioration of air quality in selected class area.

As indicated by:

Section 176(c) Clean Air Act which states that activities of all federal agencies must conform to the intent of the appropriate State Air Quality Implementation Plan and not:

- cause or contribute to any violations of ambient air quality standards
- increase the frequency of any existing violations
- impede the State's progress in meeting their air quality goals

Standard #5: Habitats are provided to maintain healthy, productive and diverse populations of native plant and animal species, including special status species (federally threatened, endangered, candidate or Montana species of special concern as defined in BLM Manual 6840, Special Status Species Management).

This means that native plant and animal communities will be maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant lifeforms. Where native communities exist, the conversion to exotic communities after disturbance will be minimized. Management for indigenous vegetation and animals is a priority. Ecological processes including hydrologic cycle, and energy flow, and plant succession are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential, and there is a diversity of plant and animal species

characteristic of and appropriate to the site. The environment contains components necessary to support viable populations of a sensitive/threatened and endangered species in a given area relative to site potential. Viable populations are wildlife or plant populations that contain an adequate number of reproductive individuals distributed on the landscape to ensure the long-term existence of the species. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

- plants and animals are diverse, vigorous and reproducing satisfactorily; noxious weeds are absent or insignificant in the overall plant community
- spatial distribution of species is suitable to ensure reproductive capability and recovery
- a variety of age classes are present
- connectivity of habitat or presence of corridors prevents habitat fragmentation
- species richness (including plants, animals, insects and microbes) are represented
- plant communities in a variety of successional stages are represented across the landscape

Guidelines for Livestock Grazing Management

Guidelines for management of herbivory (including domestic animals and wildlife) are preferred or advisable approaches to ensure that standards can be met or that significant progress can be made toward meeting the standard(s). Responsible state and federal wildlife agencies must be involved in this management if standards are to be achieved.

Guidelines are provided to maintain or improve resource conditions in upland and riparian habitats. In both riparian and upland habitats, these guidelines focus on establishing and maintaining proper functioning conditions. The application of these guidelines is dependent on individual management objectives. Desired future conditions in plant communities and streambank characteristics will be determined on a case-by-case basis.

Guideline #1: Grazing will be managed in a manner that will maintain the proper balance between soils, water, and vegetation over time. This balance varies with location and management objectives, historic use, and natural fluctuations, but acceptable levels of use can be developed that are compatible with resource objectives.

Guideline #2: Manage grazing to maintain watershed vegetation, species richness, and floodplain function. Maintain riparian vegetative cover and structure to trap and hold sediments during run-off events to build streambanks, recharge aquifers, and dissipate flood energy. Grazing management should promote deep-rooted herbaceous vegetation to enhance streambank stability. Where non-native species are contributing to proper functioning conditions, they are acceptable. Where potential for palatable woody shrub species (willows, dogwood, etc.) exists, promote their growth and expansion within riparian zones.

Guideline #3: Pastures and allotments will be managed based on their sensitivity and suitability for livestock grazing. Where determinations have not been previously documented, suitability for grazing will be determined by: topography, slope, distance from water, vegetation habitat types, and soil types must be considered when determining grazing suitability. Unsuitable areas should be excluded from grazing.

Guideline #4: Management strategies for livestock grazing will ensure that long-term resource capabilities can be sustained. End of season stubble heights, streambank moisture content, and utilization of herbaceous and woody vegetation are critical factors which must be evaluated in any grazing strategy. These considerations are essential to achieving long-term vegetation or stream channel objectives and should be identified on a site-specific basis and used as terms and conditions.

Guideline #5: Grazing will be managed to promote desired plants and plant communities of various age classes, based on the rate and physiological conditions of plant growth. Management approaches will be identified on a site-specific basis and implemented through terms and conditions. Caution should be used to avoid early spring grazing use when soils and streambanks are wet and susceptible to compaction and physical damage that occurs with animal trampling. Likewise, late summer and fall treatments in woody shrub communities should be monitored closely to avoid excessive utilization.

Guideline #6: The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect the ecological functions and processes of those sites.

Guideline #7: Locate facilities (e.g., corrals, water developments) away from riparian-wetland areas.

Guideline #8: When provided, supplemental salt and minerals should not be placed adjacent to watering locations or in riparian-wetland areas so not to adversely impact streambank stability, riparian vegetation, water quality, or other sensitive areas (i.e., key wildlife wintering areas). Salt and minerals should be placed in upland sites to draw livestock away from watering areas or other sensitive areas and to contribute to more uniform grazing distribution.

Guideline #9: Noxious weed control is essential and should include: cooperative agreements, public education, and integrated pest management (mechanical, biological, chemical).

Guideline #10: Livestock management should utilize practices such as those referenced by the NRCS published prescribed grazing technical guide to maintain, restore or enhance water quality.

Guideline #11: Grazing management should maintain or improve habitat for federally listed threatened, endangered, and sensitive plants and animals.

Guideline #12: Grazing management should maintain or promote the physical and biological conditions to sustain native populations and communities.

Guideline #13: Grazing management should give priority to native species. Non-native plant species should only be used in those situations where native seed is not readily available in sufficient quantities, where native plant species cannot maintain or achieve standards, or where non-native plant species provide an alternative for the management and protection of native rangelands.

Guideline #14: Allotment monitoring determines how ongoing management practices are affecting rangeland. To do so, the evaluations should be based on: 1. measurable management objectives; 2. permanent and/or repeatable monitoring locations; and; 3. short-term and long-term data.

APPENDIX K
Best Management Practices

The following Best Management Practices (BMPs) provide for the protection of wildlife, soils, vegetation, water quality and visual resources. While the BMPs below are listed under specific categories, the applicable BMPs would vary with the location of a project and the resource issues in that area. The best practices would be applied on a case-by-case basis to meet site-specific needs.

Range Improvements

1. Potential reservoirs and pit sites should be core drilled to determine if gravel lenses are below the structure.

2. All proposed range improvements will be designed to limit erosion, saline seeps, salt accumulations and rapid sedimentation.

3. Topsoil and suitable subsoil will be identified and stockpiled during all soil excavation activities and will be used to rehabilitate the area when the project is completed. Exceptions to this may be granted, based on a site-specific evaluation. Disturbed areas will be monitored for noxious plant infestation and control measures will be implemented as needed.

Forest Products

1. Harvest Design

   a. The following should be considered during the development of timber harvest systems:

      1) Soil characteristics and erosion hazard identification.

      2) Rainfall characteristics.

      3) Topography.

      4) Plant cover (forest type understory, silvics).

      5) Critical components (aspect, water courses, landform, etc.).

      6) Silvicultural objectives.

      7) Existing watershed condition.

      8) Potential effects of multiple resource management activity on beneficial water uses.

      9) Compliance with the Montana Water Quality Act, Public Water Supply Act, and state water quality standards. Manage community and non-community public water supply watersheds to comply with state water quality standards. The Public Water Supply Act (75-6-101-MCA) requires approval of plans and specifications for roads and other disturbances from the Montana Water Quality Bureau for activities planned for public water supply watersheds.

   b. Leave streamside management zones on both sides of perennial streams and intermittent streams with a well-defined channel. This zone provides shading, soil stabilization, and sediment and water filtering effects.

   c. Use the logging system that best fits the topography, soil type, and season, while minimizing soil disturbance and economically accomplishing silvicultural objectives. Avoid tractor skidding on slopes greater than 35%.

   d. Skid trail locations require special considerations for slopes steeper than 15% or greater.

   e. Design and locate skid trails and skidding operations to minimize soil disturbance. The use of designated skid trails is one means of limiting site disturbance and soil compaction.

   f. Locate skid trails to avoid concentrating runoff and provide breaks in grade.

   g. Locate skid trails and landings away from natural drainage systems and divert runoff to stable areas.

   h. Use the economically feasible yarding system which will minimize road densities.

   i. Roads and trails will be built or upgraded with due regard for environmental considerations. Cut-and-fill slopes should be no steeper than 3:1 where feasible. This will promote quick revegetation and soil stabilization and discourage invasion by weeds. The type of terrain (flat to steep) will be a major factor in applying the 3:1 guideline. The intent is to provide a stable seedbed where practical. After access roads are no longer needed, they will be

contoured to a natural appearance and seeded. This could apply to any road within the Monument.

2. Harvesting Activities

a. Mechanical thinning/harvesting should be conducted when the ground is dry, frozen, or snow covered to minimize soil compaction.

b. Avoid falling trees or leaving slash in streams or water bodies.

c. Limb or top trees where debris cannot fall or be dragged into the stream.

d. A 124 or 310 permit (Natural Streambed and Land Preservation Act of 1975) is required for ground skidding through any perennial stream.

e. Minimize operation of wheeled or tracked equipment within the streamside management zones of stream courses designated for protection. Do not operate equipment on stream banks.

f. End-line logs out of streamside areas when ground skidding systems are employed.

g. Fully suspend logs when line skidding across a stream and immediately above streambanks.

h. Remove debris entering any stream concurrently with the yarding operation and before removal of equipment from the project site. Accomplish debris removal so the natural streambed conditions are not disturbed. Leave naturally occurring downfall material which provides fish habitat.

i. Avoid equipment operation in wetlands, bogs, and wet meadows except on designated roads. Use end-lining and directional falling for harvest operations in these areas.

j. Repair damage to a stream course caused by logging operations, including damage to banks and channel, to as reasonable a condition as possible without causing additional damage to the stream channel.

k. Tractor skid when compaction, displacement, and erosion will be minimized.

l. Install necessary water bars on tractor skid trails prior to expected periods of heavy runoff. Appropriate spacing between bars is determined by the soil type and slope of the skid trail. Timely implementation is important.

m. Construct drainage structures on skid trails to prevent water and sediment from being channeled directly into stream courses.

n. Construct water bars and/or seed skid trails and landings, where natural revegetation is inadequate to prevent accelerated erosion, before the next growing season. A light ground cover of slash or straw will help retard erosion.

o. For south and southwest aspects, light slash should be left on the site as much as possible to minimize water erosion.

p. Avoid skidding with the blade lowered.

q. Suspend the head end of the log whenever possible.

r. Minimize the size and number of landings to that necessary for safe, economical operation.

s. Avoid decking logs within the high water mark of any stream.

t. Provide suitable delivery, storage, and disposal for all fuels, shop debris, waste oil, etc.

3. Slash Treatment and Site Preparation

a. Rapid reforestation of harvested areas is encouraged to reestablish protective vegetation.

b. Use brush blades on cats when piling slash. Avoid use of dozers with angle blades. Site preparation equipment producing irregular surfaces is preferred. Care should be taken to avoid severe disruption of the surface soil horizon.

c. Minimize or eliminate elongated exposure of soils up and down the slope during mechanical scarification.

d. Scarify the soil to the extent necessary to meet the reforestation objective of the site. Low slash and small brush should be left to slow surface runoff, return soil nutrients and provide shade for seedlings.

e. Carry out brush piling and scarification when soils are dry enough to minimize compaction and displacement.

f. Carry out scarification on steep slopes in a manner that minimizes erosion. Broadcast burning and/or herbicide application is a preferred means for site preparation on slopes greater than 40%.

g. Maintain streamside management zones between site preparation or slash disposal areas and streams.

h. Scarify landings and temporary roads on completion of use.

i. Do not apply chemical vegetation control treatment to water bodies. Provide suitable buffer strips between chemical mixing and application areas and all water bodies.

j. Apply pesticide and dispose of containers according to label and Environmental Protection Agency registration directions. Make contingency plans to follow in case of accidental spills. Mixing and disposal of chemicals should be supervised by a licensed applicator.

k. Limit water quality impacts of prescribed fire: construct water bars in firelines; reduce fuel loadings in drainage channels; maintain the streamside management zone; avoid intense fires unless needed to meet silvicultural goals.

l. Slash burning should be done with a cooler controlled fire.

Fire

1. Fire Suppression

a. Minimize watershed damage from fire suppression by avoiding heavy equipment operation on soils susceptible to severe erosion and steep slopes.

b. Stabilize suppression damage where erosion potential has increased. Treatments include installing water bars, seeding, planting, fertilizing, spreading slash or mulch on bare soil, repairing road drainage facilities, and clearing stream channels of debris.

c. Conduct burn area surveys where necessary to assess the need for rehabilitation of watershed damage. Rehabilitation measures may include: seeding, fertilizing, fencing, clearing debris from stream channels, constructing trash racks, channel stabilization structures and debris retention structures.

d. Consider the impacts of sewage disposal when establishing locations for fire camps, logging camps, or other similar facilities.

2. Prescribed Fire

a. Avoid burning on soils with a shallow surface layer and steep slopes to minimize damage to soils.

Natural Gas Operations

1. Location

a. Work with the operator to choose the best site access and facility location to mitigate for visual impacts.

b. Where practical, avoid construction in highly scenic areas.

c. Ridgetop facilities are highly visible from great distances because they are skylined. Roads, on the other hand, may be less visible if located along ridgetops, but if they are located on the ridge face they can be highly visible because of increased cut, fill and sidecast material.

d. Move facilities further from key observation points to reduce their apparent size. This may necessitate moving facilities from the shoulder of roads and trails, and placing them in the background of the view.

e. Avoid locating facilities near "prominent" features.

f. Use natural or artificial features such as topography, vegetation, or an artificial berm to help screen facilities. Locate facilities in a swale, around the bend, behind a ridge, or create a natural looking, vegetated berm.

g. Locate and construct roads and other linear facilities to follow the contour of the landform or mimic lines in the vegetation. Avoid a straight road that will draw the viewer's eye and attention straight toward the production facilities at the end of the road.

h. Where practical, use existing roads. When a suitable existing road is not available, construct a suitable road, but eliminate the redundant or obsolete roads.

i. Do not reuse existing roads just because they are preexisting and you are hesitant to disturb new areas. Choose the best location for the road and its anticipated uses. Consider safety, anticipated traffic load, and maintenance requirements as well as visual and habitat needs.

j. Avoid locating roads and pipelines on steep slopes. Follow the contours of the land to reduce earthwork/disturbance. If you must locate on a steep slope, a certified engineering and reclamation plan must be submitted and approved by the authorized officer.

k. Avoid locating well pads on steep slopes. Well pads on steep slopes can create large cut and fill slopes which are more expensive to reclaim and are highly visible from long distances. If you must locate on a steep slope, a certified engineering and reclamation plan must be submitted and approved by the authorized officer.

l. Construct the minimum road necessary. Consider using two-track roads for exploration wells that could become dry holes or production wells with very low vehicle use during production. The BLM 9113 Roads Manual states, "Bureau roads must be designed to an appropriate standard no higher than necessary to accommodate their intended functions..." Consider average daily traffic load, vehicle size, soils, topography, weather, season of use, safety, etc.

2. Operations

a. Consider drilling multiple wells from a single well pad to reduce the footprint of oil and gas activity on wildlife habitat.

b. Remote electronic monitoring of wells and related production equipment can reduce the number of maintenance and inspection truck trips made during critical time periods for wildlife and result in less wildlife disturbance.

c. Bury power lines in or adjacent to the road to eliminate cross-country vegetation clearing and resulting habitat fragmentation.

d. Noise can deter wildlife from using an area. Use noise reduction mufflers to comply with noise standards. Also, consider using earthen berms, walls, sheds, and/or distance to reduce sound levels in important habitats.

e. Reduce vehicle traffic in important wildlife areas and during critical wildlife use periods. Consider:

1) Seasonal restriction of public vehicular access in new development areas such as dead-ends, well access roads or designated portions of the field.

2) Operator-enforced speed limits during critical seasons.

3) Use of shuttle vans and buses to transport drilling rig workers and field service personnel.

f. Cover all production-related pits and tanks to exclude wildlife, regardless of pit or tank size. Migratory birds can drown in small volumes of water and other fluids. Violations of the Migratory Bird Treaty Act can result in substantial penalties.

g. Minimize the footprint of energy development. To reduce wildlife habitat fragmentation, loss, and degradation, consider lower class roads, smaller pads, and interim reclamation.

3. Reclamation

a. Interim reclamation is short-term reclamation that occurs as the well is beginning initial production of oil and/or gas. It includes partially reshaping and revegetating roads and well pads to reduce the amount of bare ground created during construction and drilling activity.

b. To minimize habitat loss and fragmentation, re-establish as much habitat as possible by maximizing the area reclaimed during well production operations. In many cases, this "interim" reclamation can cover nearly the entire site.

c. Limit activities to only the area that is necessary.

d. Interim reclamation should begin shortly after construction or establishing oil or gas production on the site. Steps include: (1) Fully recontour unneeded areas to the original contour or a contour that blends with the surrounding topography; (2) Respread topsoil over the entire pad; and (3) Revegetate to re-establish habitat.

e. Seed with the proper species, varieties, and amounts of seed. The use of native species is preferred. Consider adding shrubs and forbs to the seed mixture, where appropriate, to re-establish habitat.

f. Borrow ditches should be covered with topsoil and seeded. Consider seeding the road surface for low use roads. Forage and habitat is partially restored.

g. When well production ends, begin final reclamation. Ensure the site is recontoured, stable, and fully revegetated.

Roads

1. Location

   a. Minimize the number of roads constructed in a watershed through comprehensive road planning, recognizing intermingled ownership and foreseeable future uses. Use existing roads where practical.

   b. Fit the road to the topography. Locate roads on natural benches and stable soil types to minimize the area of road disturbance.

   c. Locate roads on well-drained soils and rock formations that tend to dip into the slope. Avoid slide-prone areas characterized by seeps, steep slopes, highly weathered bedrock, clay beds, concave slopes, hummocky topography, and rock layers that dip parallel to the slope.

   d. Avoid high erosion hazard sites, such as steep, narrow canyons, slide areas, slumps, swamps, wet meadows, or natural drainage channels. Where there is potential for material to enter a stream, obtain approval of the Conservation District and/or the Water Quality Bureau under applicable laws (i.e., 124 or 310 permit).

   e. Locate roads a safe distance from streams when roads are running parallel to stream channels. Provide an adequate streamside management zone in order to catch sediment and prevent its entry in to the stream.

   f. Minimize the number of stream crossings.

   g. Cross streams at right angles to the main channel if practical.

   h. Choose a stable stream crossing site and adjust the road grade to reach the site if possible.

   i. Avoid unimproved stream crossings. Where a culvert or bridge is not feasible, locate drive-throughs on a stable, rocky portion of the stream channel.

   j. A 124 or 310 permit (Natural Streambed and Land Preservation Act of 1975) is required before disturbance is allowed within the area between the normal high water marks of perennial streams.

   k. Avoid long, sustained, steep road grades. Where unavoidable, a certified engineering and reclamation plan must be submitted that demonstrates how erosion will be controlled and site productivity will be returned.

   l. Vary road grades to reduce concentrated flow in road drainage ditches and culverts to reduce erosion on cut and fill slopes and road surface.

   m. When locating roads, provide access to suitable log landing areas (flatter, well-drained) in order to reduce soil disturbance.

2. Design

   a. Incorporate preventive action into transportation plans. Minimize disturbance. Use available information to help identify erodable soils, unstable areas, and road surface materials.

   b. Plan roads to the minimum standard necessary to accommodate anticipated use and equipment. When using existing roads, avoid reconstruction unless absolutely necessary. The need for higher standard roads can be alleviated through better road use management.

   c. Construct cut and fill slopes at stable angles.

   d. Use plans that balance cuts and fills or use full bench construction (no fill slope) where stable fill construction is not possible. Haul excess material to a safe disposal site and include these waste areas in soil stabilization planning for the road.

   e. Contour and roll road grades for minimal disruption of drainage patterns.

3. Drainage

   a. Design water crossing structures at points where it is necessary to cross stream courses. Provide for adequate fish passage, minimum impact on water quality, and at a minimum the 25-year frequency runoff. A 124 or 310 permit is required for perennial stream crossings.

   b. Install culverts to conform to the natural stream bed and slope. Place culverts slightly below normal stream grade to avoid culvert outfall barriers.

   c. Design culvert installations to prevent erosion of fill. Compact the fill material to prevent seepage and failure. Armor the inlet and/or outlet with rock or other suitable material where needed.

   d. Provide adequate drainage for the road surface. Use outsloped roads, insloped roads with ditches and cross drains or drain dips. Dips should be constructed deep enough into the subgrade that traffic will not obliterate them.

e. Plan ditch gradients steep enough, generally greater than 2%, but less than 8%, to prevent sediment deposition and ditch erosion. Gradient depends on parent material.

f. Design the spacing of road drainage facilities based on geologic type, soil erosion class, and road grade.

g. Where possible, install ditch relief culverts at the gradient of the original ground slope, otherwise anchor downspouts to carry water safely across the fill slope.

h. Skew relief culverts 20 to 30 degrees toward the inflow from the ditch to provide better inlet efficiency.

i. Provide energy dissipaters where necessary at the downstream end of ditch relief culverts to reduce the erosion energy of the emerging water.

j. Protect the upstream end of cross drain culverts from plugging with sediment and debris. Prevent downslope movement of sediment by using sediment catch basins, drop inlets, changes in road grade, headwalls, and recessed cut slopes.

k. Install culverts to assure protection from crushing due to traffic. Use 1-foot minimum cover for corrugated metal pipes 15 to 36 inches in diameter, and a cover of one-third diameter for larger corrugated metal pipes.

l. Use corrugated metal pipes with a minimum diameter of 15 inches to avoid plugging.

m. Install road drainage facilities above stream crossings so water may be routed through a streamside management zone before entering a stream.

4. Construction

a. Place debris, overburden, and other waste materials associated with construction activities in a location to avoid entry into streams.

b. Minimize stream channel disturbances and related sediment problems during construction of roads and installation of stream crossing structures. Do not place easily eroded material into live streams. Remove material stockpiled on a floodplain before rising water reaches the stockpile. Locate bypass roads to have minimal disturbance on the stream course. Limit construction activity to specific times to protect beneficial water uses.

c. Minimize earth moving activities when soils appear excessively wet. Do not disturb roadside vegetation more than necessary to maintain slope stability and to serve traffic needs.

d. Clear all vegetative material before constructing the fill portion of the road prism.

e. On potentially erodable fill slopes, windrow slash at the toe of the fill slopes to trap sediment, particularly near stream crossings and on erodable fill slopes. Leave breaks for wildlife passage.

f. Stabilize erodable, exposed soils by seeding, compacting, riprapping, benching, mulching, or other suitable means prior to spring or fall runoff.

g. Keep slope stabilization, erosion and sediment control work as current as possible with road construction.

h. Install drainage structures concurrent with construction of new roads and always prior to spring or fall runoff.

i. Complete or stabilize road sections within the same operating season as construction is started, rather than leaving major road sections in a pioneer condition over a winter season.

j. Minimize sediment production from borrow pits and gravel sources through proper location, development, and reclamation.

5. Maintenance

a. Avoid cutting the toe of stable cut slopes when grading roads or pulling ditches.

b. When plowing snow for winter timber harvest, provide breaks in the snow berm to allow road drainage.

c. Keep erosion control measures functional through periodic inspection and maintenance.

d. Haul all excess material removed by maintenance operations to safe disposal sites. Apply stabilization measures to these sites to prevent erosion. Avoid sidecasting material where it will enter a stream or be available to erode directly into a stream.

e. Leave closed roads in a condition that provides adequate drainage without further maintenance.

f. Restrict the use of roads during wet periods and the spring breakup period if damage to road drainage features resulting in increased sedimentation is likely to occur.

6. Reclamation

a. Includes recontouring the road back to the original contour, seeding, controlling noxious weeds, and may also include other techniques to improve reclamation success, such as ripping, scarifying, replacing topsoil, placing waterbars, pitting, mulching, redistributing woody debris, and barricading.

b. Seeds of native, perennial species or other plan materials specified by the Monument Manager must be used. If waterbars were used, they should be removed and seeded following successful revegetation.

APPENDIX L
Cultural Resource Use Categories

Identifying and Evaluating Cultural Resources

The following information is found in BLM Manual 8110.

.4 Categorizing Cultural Resources as to Uses. Categorizing cultural resources according to their potential uses is the culmination of the identification process and the bridge to protection and utilization decisions. Use categories establish what needs to be protected, and when or how use should be authorized. All cultural resources have uses, but not all should be used in the same way. Cultural resources can be allocated to the various recognized use categories even before they are individually identified. The clear advantage in doing this is that it allows Field Office managers to know in advance how to respond to conflicts that arise between specific cultural resources and other land uses. Relative to the national Programmatic Agreement, categorizing resources to uses provides a mechanism for the Field Office manager and the SHPO to confer and concur on how to handle most routine cases of conflict in advance, enabling the Field Office manager to put decisions into effect in the most appropriate and most timely manner.

.41 Allocations to Use Categories.

A. Field Office managers shall allocate to appropriate use categories all cultural properties known and projected to occur in a plan area. Allocations are made in land use plans (RMP), and may be applied both to individual properties and to classes of similar properties. Appropriately qualified staff professionals recommend suitable uses for each cultural property or class of properties, considering the properties' characteristics, condition, setting, location, and accessibility, and especially their perceived values and potential uses. A cultural property may be allocated to more than one use category or it may pass from one category to another (e.g., from Scientific Use to Public Use, as when an archaeological property becomes appropriate for in-place interpretation and conservation for future scientific use, upon completion of scientific investigation). During the compliance process for proposed land uses, allocations allow Field Office managers to analyze needs and develop appropriate mitigation and treatment options. Allocations should be consistent with historic context documents and State Historic Preservation Plans.

B. Allocations should be reevaluated and revised, as appropriate, when circumstances change or new data become available. Conditions and/or criteria for revising allocations must be included in the RMP, or else revisions may require a plan amendment.

C. A Field Office more than 1 year from an RMP start may assign cultural resources to use categories through an implementation plan (e.g., integrated or interdisciplinary plan, coordinated resource management plan, or landscape management plan) that implements any commitment in an existing land use plan to manage cultural resources appropriately (even if only a commitment to comply with the national Historic Preservation Act; see next to last sentence in .41A). Assignments made in implementation plans do not become full allocation decisions until incorporated in an approved RMP.

.42 Use Categories

A. Scientific Use. This category applies to any cultural property determined to be available for consideration as the subject of scientific or historical study at the present time, using currently available research techniques. Study includes methods that would result in the property's physical alteration or destruction. This category applies almost entirely to prehistoric and historic archaeological properties, where the method of use is generally archaeological excavation, controlled surface collection, and/or controlled recordation (data recovery). Recommendations to allocate individual properties to this use must be based on documentation of the kinds of data the property is thought to contain and the data's importance for pursuing specified research topics. Properties in this category need not be conserved in the face of a research or data recovery (mitigation) proposal that would make adequate and appropriate use of the property's research importance.

B. Conservation for Future Use. This category is reserved for any unusual cultural property which, because of scarcity, a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons, is not currently available for consideration as the subject of scientific or historical study that would result in its physical alteration. A cultural property included in this category is deemed worthy of segregation from all other land or resource uses, including cultural resource uses, that would threaten the maintenance of its present condition or setting, as pertinent, and will remain in this use category until specified provisions are met in the future.

C. Traditional Use. This category is to be applied to any cultural resource known to be perceived by a specified social and/or cultural group as important in maintaining the cultural identity, heritage, or well-being of the group. Cultural properties assigned to this category are to be managed in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use.

D. Public Use. This category may be applied to any cultural property found to be appropriate for use as an interpretive exhibit in place, or for related educational and recreational uses by members of the general public. The category may also be applied to buildings suitable for continued use or adaptive use, for example as staff housing or administrative facilities at a visitor contact or interpretive site, or as shelter along a cross-country ski trail.

E. Experimental Use. This category may be applied to a cultural property judged well-suited for controlled experimental study, to be conducted by BLM or others concerned with the techniques of managing cultural properties, which would result in the property's alteration, possibly including loss of integrity and destruction of physical elements. Committing cultural properties or the data they contain to loss must be justified in terms of specific information that would be gained and how it would aid in the management of other cultural properties. Experimental study should aim toward understanding the kinds and rates of natural or human-caused deterioration, testing the effectiveness of protection measures, or developing new research or interpretation methods and similar kinds of practical management information. It should not be applied to cultural properties with strong research potential, traditional cultural importance, or good public use potential, if it would significantly diminish those uses.

F. Discharged from Management. This category is assigned to cultural properties that have no remaining identifiable use. Most often these are prehistoric and historic archaeological properties, such as small surface scatters of artifacts or debris, whose limited research potential is effectively exhausted as soon as they have been documented. Also, more complex archaeological properties that have had their salient information collected and preserved through mitigation or research may be discharged from management, as should cultural properties destroyed by any natural event or human activity. Properties discharged from management remain in the inventory, but they are removed from further management attention and do not constrain other land uses. Particular classes of unrecorded cultural properties may be named and described in advance as dischargeable upon documentation, but specific cultural properties must be inspected in the field and recorded before they may be discharged from management.

Upper Missouri River Breaks National Monument

In order to allocate the numerous known sites and sites "projected to occur" (those yet to be found or recorded) into the identified use categories, criteria must be established which employ a combination of easily recognizable site type and site attribute information that can, for example, differentiate between small, short duration, limited activity sites and large, complex multiple-activity sites. For prehistoric resources the criteria are weighted to emphasize the "information potential," since the determination significance for such sites is generally related to their scientific value. For historic resources, the criteria are more reflective of site "condition and integrity" characteristics, which play a greater role in the evaluation of historic properties.

It is also important to recognize that it is possible for sites to be placed into more than one use category. As an example, a prehistoric site with little or no scientific value could be placed in a Discharge from Management category, but also be useful in the Experimental Use category. Similarly, an historic site could be placed in the Public Use category, but require stabilization and preservation efforts and therefore warrant placement into the Conserve for Future Use category as well.

Prehistoric Resources

Since over 90% of prehistoric sites in the planning area are defined as lithic scatters, it is important to be able to identify potential discriminating elements that can be used to segregate such a large category of prehistoric resources into different use categories. A qualitative assessment of certain aspects of material culture (relative diversity and quantity of artifactual materials) and complexity (spatial patterning of artifacts, presence/absence of features, presence/absence of buried deposits, etc.), coupled with a quantitative measure of site size (in acres) can be utilized to meet the purposes identified. These values will serve as indirect indicators of relative site function, relative duration of occupation, research value, and importance.

The important aspects of material culture include:

Artifact diversity – variety of cultural materials present such as raw material types, variety of materials present bone, stone, ethno botanical qualitatively measured from low to high.

Artifact quantity – relative quantity of material culture present (less than 50 items, hundreds, thousands, etc.) a qualitative measure intended to capture "magnitudes of difference."

Site complexity – as indicated by any spatial patterning in distribution of cultural material, the presence or absence of associated features, the presence of buried deposits and stratigraphy. Site complexity is qualitatively measured from low to high.

Site size – a quantitative measure, looking for modal patterns in overall site size that may reflect a number of things, site function, duration of occupation, etc. These variables will serve as a model to distinguish between the small, more redundant and transient, or temporary, limited use lithic scatters, and larger, longer occupied, camps/habitation sites, and/or extractive use locations.

Based on the model presented above, it is expected that use categories to be reflected as follows:

Scientific Use

Prehistoric sites that exhibit high diversity and large quantity (>50 artifacts) of material culture, high complexity (spatial patterning of artifacts/activities, presence of features, stratified or buried deposits), and relatively larger size properties would be placed into the Scientific Use category.

Conservation Use

Sites that are representative of rare, or exceptional examples (functionally or temporally) would be considered for Conservation Use.

Traditional Use

In consultation with Native American groups, certain types of prehistoric sites retain particular importance and significance (Deaver 1986). These site types most commonly include: burial locations, pictograph/ petroglyph sites, and vision quest locations. Medicine wheels, dance grounds and intaglios (e.g., Napi Figures) also are in this category, but none are known to occur on public lands in the planning area. In addition, certain tipi ring sites may also fit this use category but need to be evaluated on a case-by-case basis. Collectively these sites amount to less than 1% of recorded cultural resources in the planning area.

Public Use

Prehistoric sites could be considered for Public Use (interpretation) in those few instances where interpretive potential is high and site integrity could be insured through protective measures. Such uses should not be attempted without full consultation with interested Native American groups. Consequently, such prehistoric sites still require evaluation on a case-by-case basis. Current opportunities include the Nez Perce Trail and the Cow Island Crossing.

Experimental Use or Discharge from Use

Sites with low diversity and limited quantity (<50) of artifacts; low or limited complexity; and small size (redundant small surface lithic scatter, information potential is exhausted with initial site recordation). Sites will be individually evaluated prior to placement into Experimental Use or Discharge from Use categories.

Historic Resources

Unlike prehistoric resources, historic properties are more commonly determined to be significant for reasons other than their "scientific value." Similarly, condition and integrity also tend to play more obvious roles in the evaluation of historic properties, which contain architectural or structural remains. Historic resources in the planning area also vary greatly in size, function, and complexity; ranging from small trash dumps, homesteads and other agricultural developments, early exploration and river transportation, wood hawker activity, military establishments, and abandoned wagon roads.

Scientific Use

Historic sites with archaeological and historical values and generally poor, structural integrity (collapsed or deteriorated), would be placed in this category.

Conservation Use

Historical sites that are rare or exceptional examples that retain integrity would be considered for Conservation Use. In the planning area this would include well-preserved remnants of homesteads (Hagadone). It should be noted that the defined use categories are not necessarily mutually exclusive, and that many sites can be placed in both the Conservation Use category (need to stabilize and preserve the architectural features) and the Public Use Category and possibly Scientific Use for example.

Traditional Use

Historic sites in this category would potentially include any sacred areas, traditional cultural properties, or plant gathering areas that have been historically utilized by Native American groups that have historically occupied the area. These sites would be determined in consultation with tribal representatives that have demonstrated historical use in the planning area. To date, Native American traditional use areas have been yet to be identified.

Public Use

Historic sites that would be considered for Public Use include those where the interpretive potential is high and site integrity could be insured through protective

measures. In addition, consideration is given for those standing structures that could be preserved and maintained for adaptive re-use for administrative or recreational uses. Historical themes that would lend themselves to interpretation include:

Early Exploration
Lewis and Clark Corps of Discovery
Fur Trade Era

Historic Transportation Routes
Steamboat Era/Woodhawkers
Cow Island Crossing
Judith Landing
Stafford Ferry
Ervin Ridge Road

Historic Homesteading/Ranching
Hagadone
Gist Bottom
Middleton
Nelson

There are also numerous standing cabin structures and homesteads on public lands across the planning area that may potentially be sufficiently preserved, to be considered for a program of adaptive reuse and utilized as BLM administrative structures and/or in a recreational cabin rental program.

Experimental Use or Discharge from Use

Like prehistoric sites, individual sites would be evaluated on a case-by-case basis before assignment to either the Experimental Use or Discharge from Use categories. In general, properties assigned to these categories would have been determined to contain little or no scientific or historical value. Sites in these categories would generally include isolated trash dumps and artifact scatters, isolated features such as prospect pits or claim markers, and collapsed structural remains that no longer retain integrity of design or workmanship. Only those sites that have been formally determined to be Not Eligible for the National Register of Historic Places would be placed into either of these categories.

Cultural properties are evaluated with reference to National Register criteria for the purposes of assessing their historical values and their public significance. Such evaluations are carefully considered when cultural properties are allocated to use categories. Although preservation and nomination priorities must be weighted on a case-by-case basis, Table L.1 serves as a general guide illustrating the relationship between National Register evaluation and allocation to use categories.

Table L.1
Relationship Among Cultural Resource Use Categories, National Register Eligibility, and Preservation/National Register Nomination

Cultural Resource Use Category	*National Register Eligibility*	*Preservation/National Register Nomination*	*Site Types Generally Included*
Scientific Use	Usually Eligible	Long-term preservation not critical; medium National Register nomination priority.	**Prehistoric**: Sites with high artifact count and diversity, high complexity, and larger size; **Historic**: Sites with archaeological and historic values, and generally poor structural integrity.
Conservation for Future Use	Always Eligible	Long-term preservation is required; highest nomination priority.	**Prehistoric**: Sites inherently complex, or rare, or fragile and exhibit exceptional scientific values (e.g. deeply stratified deposits, or large quarries); **Historic**: Sites inherently complex, or rare, or fragile, generally significant standing structures (stabilization and preservation required).

Table L.1
Relationship Among Cultural Resource Use Categories, National Register Eligibility, and Preservation/National Register Nomination

Cultural Resource Use Category	*National Register Eligibility*	*Preservation/National Register Nomination*	*Site Types Generally Included*
Traditional Use	May Be Eligible	Long-term preservation is desirable; nomination priority is determined in consultation with the appropriate cultural group(s).	Sites and locations determined in consultation with Tribal Groups. **Prehistoric** may include: Burial locations, vision quest locations, pictographs and petroglyphs, certain tipi ring sites; **Historic/Modern**: Plant gathering locations, areas considered sacred for religious purposes, etc.
Public Use	Usually Eligible	Long-term preservation is desirable; high nomination priority.	**Prehistoric**: High interpretive potential and can insure protection; **Historic**: High interpretive potential and can insure stabilization and protection, and/or adaptive reuse.
Experimental Use	May Be Eligible	Long-term preservation is not anticipated; low nomination priority.	**Prehistoric**: Lithic scatters of limited artifact density and complexity; **Historic**: Trash scatters, collapsed structures with no integrity or context
Discharge from Management	Not Eligible	Long-term preservation and management are not considerations; nomination is inappropriate.	**Prehistoric**: Isolated finds, surface lithic scatters <50 items; **Historic**: Isolated prospect pits; trash scatters <50 items, sites <50 years old

APPENDIX M
Watershed Planning Process

The watershed planning process was developed as a practical means to implement decisions made in approved Resource Management Plans, assess and determine the health of the public land, review and update grazing permits/leases and incorporate Guidelines for Livestock Grazing Management to meet Standards for Rangeland Health.

Watershed plan areas are identified by grouping public land grazing allotments which have similar resource values, are in a common geographic area, and have common or similar resource concerns. Once the watersheds are identified, each is prioritized on the basis of resource management needs, amount of public land, relative amount of public land and resource values in relationship to private, state and other landowners, current and anticipated uses, and practical management opportunities for the public land.

Once prioritized, issues are identified for the priority watershed, applicable RMP decisions are assembled, and existing resource information and authorizations for the public land are reviewed. Issue identification includes participation by the public and affected interests. Through media notices, letters to interested or affected parties, discussions with current users of the public land, public meetings and coordination consultation meetings with groups, other agencies and governmental entities, issues and concerns for the watershed are refined and a desired future condition is outlined.

Under Standards for Rangeland Health (August 1997) (43 CFR 4180), it is necessary to assess and make determinations whether Standards are being met. These assessments and determinations are prepared for each allotment in a watershed. If a finding of not meeting Standards is made, then a determination of cause is identified and a recommended course of action or alternatives are developed to meet Standards. Concurrent with this process is a review of the grazing authorizations for allotments to verify that they include appropriate guidelines for livestock grazing management to meet Standards for Rangeland Health.

Alternatives for management to meet the desired future conditions are developed in consultation with affected and interested publics. Alternatives include a no action alternative and one or more additional alternatives.

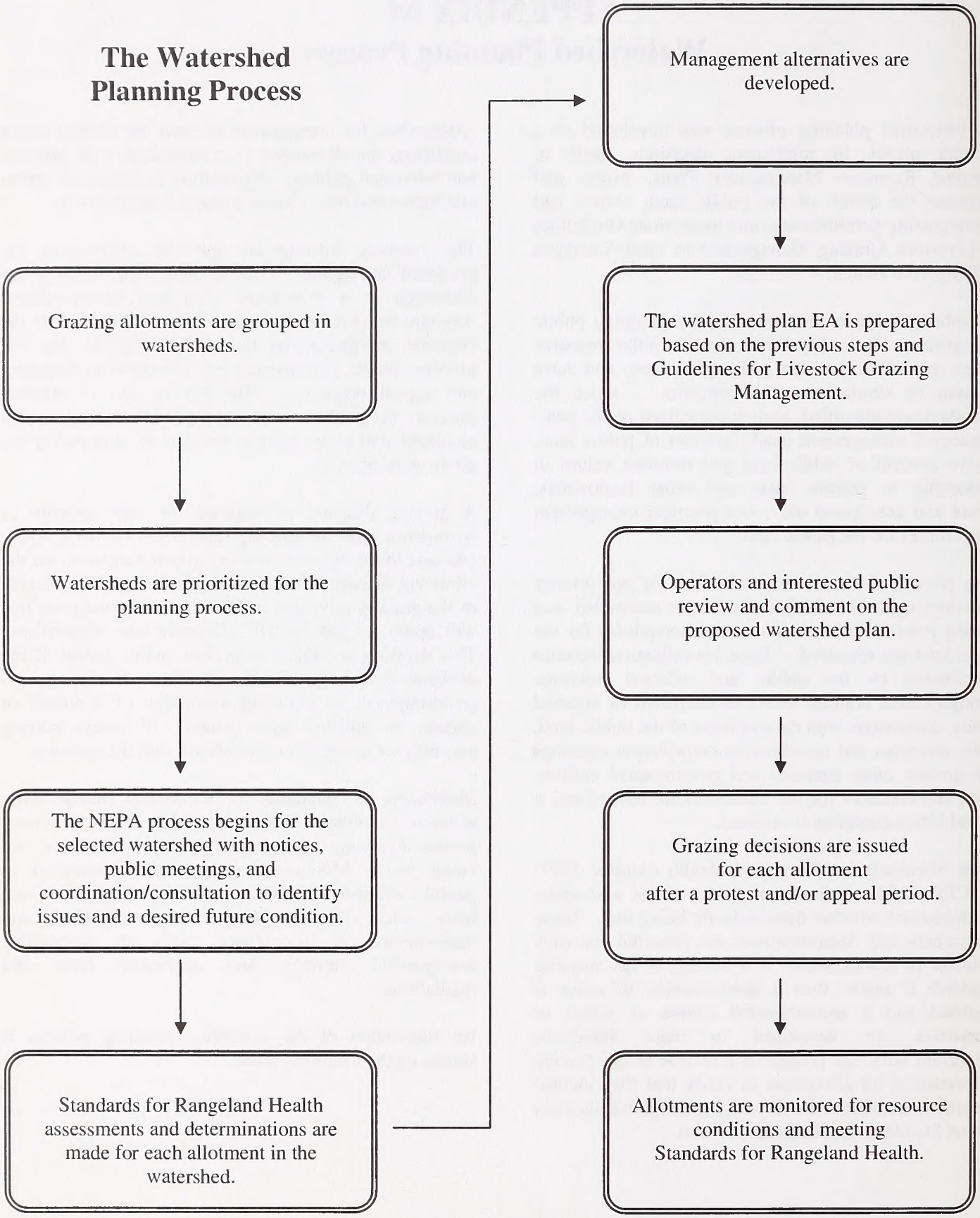
The resource information and the alternatives for proposed management/projects and their impacts are addressed in a Watershed Plan and Environmental Assessment (EA) document. In accordance with the National Environmental Policy Act (NEPA), the EA involves public participation and is subject to comment and appeal processes. The EA is sent to affected interests for public review, and public meetings and a comment period are held to provide an opportunity for public participation.

A grazing decision is prepared for each operator in accordance with the grazing regulations (43 CFR 4160) and sent to the operator and any affected interests for the allotment or permit/lease. The decision includes details of the grazing privilege(s) and terms and conditions that will apply for the specific allotment and permit/lease. This decision is subject to protest and/or appeal of the decision within specific timeframes. If there is no protest/appeal, or following resolution of a protest or appeal, an updated term (usually 10 years) grazing permit/lease is issued in accordance with the decision.

Monitoring of Standards for Rangeland Health, other resource conditions and compliance is a continuous process to ensure management goals and objectives are being met. Monitoring results are documented in periodic evaluation reports. If management goals are not being met, needed changes are identified and implemented in accordance with an appropriate management strategy and applicable laws and regulations.

An illustration of the watershed planning process is shown on the following page.

The Watershed Planning Process



APPENDIX N
Grazing Allotments

Allotment Number	Allotment Name	Allotment Totals				Percent Allotment in Monument	Grazing Season	Watershed Planning Area
		Acres	AUMs	Acres BLM Land	AUMs BLM Land			
	North Side Allotments							
944	Lutge Place	3259	368	2265	90	100	4/15 - 5/31, 10/1 - 11/15	Bears Paw to Breaks
5607	North Cabin Creek	1262	277	1111	243	100	5/16 - 9/15	Beauchamp
5609	Cabin Creek	13786	1660	6734	762	100	5/1 - 10/31, 12/1 - 3/31	Beauchamp
5610	Antelope Creek	51492	5496	45010	4701	100	5/1 - 12/31	Beauchamp
6164	3 mile ridge	10961	1509	10321	1440	10	4/1 - 5/31	Bears Paw to Breaks
6168	Al's Creek	4577	592	3385	369	75	5/1 - 9/22	Bears Paw to Breaks
6169	Chimney Butte	7773	778	7112	720	30	7/15 - 10/10	Bears Paw to Breaks
6171	Little Suction	1651	163	1405	131	10	6/1 - 6/30	Bears Paw to Breaks
6172	Timber ridge	17604	2485	11599	1662	50	3/1 - 10/22	Bears Paw to Breaks
6181	Bullwhacker	45890	5072	40535	4400	90	4/1 - 2/28	Bears Paw to Breaks
6182	Hay Coulee	12956	1267	12956	1267	100	variable - resource reserve	Bears Paw to Breaks
6192	N. Fk Lion Coulee	9362	1641	3930	592	60	5/15 - 10/01	Bears Paw to Breaks
6193	Lion Coulee	3560	438	3351	410	60	5/15 - 11/15	Bears Paw to Breaks
6194	Spencer Ridge	10198	1022	7250	588	100	5/1 - 10/31	Bears Paw to Breaks
6198	Chase Hill	2665	303	1218	98	60	3/1 - 2/28	Bears Paw to Breaks
6201	Halley	7710	749	3806	441	100	5/15 - 10/19	Bears Paw to Breaks
6203	Golf Bench	6730	1187	3319	230	10	6/1 - 8/31	Bears Paw to Breaks
6207	Ragland Ridge	1228	52	1085	25	70	6/15 - 10/15	Bears Paw to Breaks
6208	Lost Ridge	10452	1080	6253	487	95	5/15 - 11/15	Bears Paw to Breaks
6209	Barnard Ridge	3837	322	3197	279	100	6/1 - 8/30	Bears Paw to Breaks
6211	Black Butte	8305	852	8305	730	100	5/1 - 11/14	Bears Paw to Breaks
6212	Ervin Rigetop	11251	769	9973	650	100	6/15 - 10/10	Bears Paw to Breaks
6214	Little Bullwhacker	24257	1556	22278	1368	100	5/15 - 10/15	Bears Paw to Breaks
6215	Dark Butte	6976	656	4404	329	90	6/1 - 10/05	Bears Paw to Breaks
6216	Pablo Rapids	3419	168	2644	105	90	6/1 - 9/22	Bears Paw to Breaks
6218	Sneath Common	6700	485	5800	344	100	6/10 - 10/21	Bears Paw to Breaks
6221	Deadman Rapids	1646	110	1646	110	100	7/1 - 9/30	Bears Paw to Breaks
6222	Gallatin Rapids	6443	318	5404	277	100	5/1 - 11/01	Bears Paw to Breaks
6224	Upper Dauphine Rapids	**	**	1663	75	100	5/1 - 11/30	Bears Paw to Breaks
6225	Dauphine Rapids	**	**	214	25	100	6/1 - 8/5	Bears Paw to Breaks

Allotment Number	Allotment Name	Allotment Totals				Percent Allotment in Monument	Grazing Season	Watershed Planning Area
		Acres	AUMs	Acres BLM Land	AUMs BLM Land			
6269	North Timber Ridge	4450	774	1125	145	10	5/15 - 5/31	Bears Paw to Breaks
6282	Greasewood Bottom	673	124	517	100	100	7/1 - 9/30 varies	Bears Paw to Breaks
6283	Williamson Bottom	479	32	479	32	100	7/1 - 9/30 varies	Bears Paw to Breaks
6284	Sturgeon Island	558	70	558	70	100	7/1 - 9/30 varies	Bears Paw to Breaks
6285	West Gist	312	56	312	56	100	7/1 - 9/30 varies	Bears Paw to Breaks
6434	Cabin			1825	429	20	6/1 - 12/07	Vimy
	North Side Allotments (Custodial Authorizations*)							
820	Sanford Pasture	701	72	701	72	100	3/1 - 2/28 (extended nonuse)	Bears Paw to Breaks
855	T26N R12E sc1	40	0	40	0	100	not allocated	Bears Paw to Breaks
864	T26N R12E Sec 4	29	0	29	0	100	not allocated	Bears Paw to Breaks
866	T27N R12E Sec 26	40	0	40	0	100	not allocated	Bears Paw to Breaks
867	T26N R12E Sec 5	40	0	40	0	100	not allocated	Bears Paw to Breaks
868	T26N R12E Sec 3	15	0	15	0	100	not allocated	Bears Paw to Breaks
905	Wood Property	2169	0	2169	0	100	not allocated for grazing	Vimy
5611	Upper Cyprian Ck	3779	646	3779	646	65	custodial 3/1 - 2/28	Beauchamp
5629	Coal Mine Coulee	423	53	423	53	100	custodial 3/1 - 2/28	Beauchamp
6210	Maxwell	100	10	100	10	100	custodial 4/15 - 10/31	Bears Paw to Breaks
6220	Eight Mile Bench	818	89	818	89	80	custodial 5/1 - 11/30	Bears Paw to Breaks
6223	Husar Home Place	83	13	83	13	50	custodial 8/15 - 10/31	Bears Paw to Breaks
6254	Lost Bird	40	6	40	6	100	custodial 3/1 - 2/28	Bears Paw to Breaks
6273	Bear Point	279	24	279	24	100	custodial 5/1 - 11/30	Bears Paw to Breaks
6420	Clinard Coulee	628	76	628	76	60	custodial 3/1 - 2/28	Bears Paw to Breaks
6422	N Hanging 5	444	52	444	52	90	custodial 3/1 - 2/28	Vimy
6424	Balzek	336	90	336	90	50	custodial 5/15 - 11/14	Bears Paw to Breaks
6425	Piedras	1002	54	1002	54	90	custodial 8/1 - 11/1	Bears Paw to Breaks
6426	White Rocks	186	42	186	42	100	custodial 6/1 - 10/31	Bears Paw to Breaks
6428	Osterman	200	42	200	42	50	custodial 5/1 - 12/31	Bears Paw to Breaks
6429	Puma	156	53	156	53	50	custodial 6/1 - 12/15	Bears Paw to Breaks
6481	Jurenka	130	7	130	7	100	custodial 7/1 - 9/30	Bears Paw to Breaks
16350	South Vimy	920	95	920	95	30	custodial 5/1 - 9/1	Vimy
	South Side Allotments							
2000	Fink Exchange of Use	**	**	233	41	100	6/1 - 7/15	Armells

Allotment Number	Allotment Name	Allotment Totals				Percent Allotment in Monument	Grazing Season	Watershed Planning Area
		Acres	AUMs	Acres BLM Land	AUMs BLM Land			
2013	W. Indian Butte	16542	1889	11490	1132	95	5/1 - 11/15	Armells
2018	Mayberry	7018	820	2933	393	50	5/1 - 11/1	Armells
2021	Lower Armells	3073	397	2631	327	100	6/1 - 12/1	Armells
2024	Sawmill Coulee	5436	856	3881	567	85	6/1 - 10/31	Armells
2038	Barnes Ridge	2403	283	1763	214	100	6/1 - 7/1, 10/1 - 10/31	Two Calf
2039	Two Calf	**	**	9223	1269	100	6/1 - 11/30	Two Calf
2040	Lower Fargo Coulee	**	**	1046	169	80	5/1 - 6/30, 11/15 - 2/28	Armells
2517	Woodcock Coulee	3545	514	918	112	25	5/1 - 10/30	AC/UR/WR***
9649	ABN	**	**	237	66	80	4/1 - 1/1	AC/UR/WR
9687	Dammel	**	**	920	66	100	5/1 - 6/16, 3/1 - 2/28	Upper Missouri
9703	Melton Coulee	**	**	1503	157	100	3/1 - 2/28	AC/UR/WR
9707	Arrow Ck West	**	**	575	111	100	10/2 - 1/28	AC/UR/WR
9729	Kipps Rapids	**	**	820	104	100	6/15 - 10/8	Upper Missouri
9797	Evans Bend	**	**	1148	131	40	3/1 - 4/1, 8/1 - 2/28	AC/UR/WR
9799	Hole in the Wall	**	**	625	94	100	5/1 - 11/15	Upper Missouri
9808	Starve Out Flat	**	**	958	291	30	5/15 - 11/15	Upper Missouri
9826	Flat Ck	**	**	735	80	50	8/1 - 10/15	Upper Missouri
9838	White Rocks	6855	**	2365	329	60	5/1 - 12/1	Upper Missouri
9847	Slide Coulee	5167	860	3435	494	100	5/1 - 12/31	AC/UR/WR
9864	Grace Bench	**	**	246	31	100	10/1 - 11/30	AC/UR/WR
9866	Wilson Coulee	**	**	1207	210	60	4/1 - 12/30	AC/UR/WR
10041	Reservation Bench	**	**	2760	169	100	5/1 - 11/30	AC/UR/WR
15123	PN Sag	12151	2137	3637	563	100	6/1 - 10/15	Upper Missouri
15124	Dog Ck 20	8624	1145	7390	894	100	10/15 - 2/28	Upper Missouri
15125	Judith River	12068	1896	3099	424	95	3/1 - 2/28	Upper Missouri
15132	Whiskey Ridge	2941	453	2694	399	20	5/15 - 9/15	AC/UR/WR
19807	Churchill Butte	**	**	229	29	60	6/1 - 9/30, 4/1 - 12/30	AC/UR/WR
19837	Sheep Shed Coulee	6255	895	5901	697	45	7/10 - 11/29	Upper Missouri
20010	Blind Canyon AMP	6220	2574	2300	288	80	5/1 - 10/31	AC/UR/WR
20026	Demars	5474	456	5019	401	100	6/1 - 10/31, 3/1 - 2/28	Two Calf
20031	Woodhawk	**	**	25606	3120	70	5/1 - 10/31, 3/1 - 2/28	Woodhawk
20037	Armells	2854	620	1752	378	15	5/15 - 10/15	Armells
20039	Mutton Coulee	1600	327	880	179	100	6/6 - 10/1	AC/UR/WR
20040	Arrow Ck East	4212	**	1693	287	100	10/2 - 1/28	AC/UR/WR
20045	Mattuschek	**	**	7762	892	85	5/6 - 10/31, 3/1 - 2/28	Upper Missouri
20046	River	5424	629	4192	347	100	5/10 - 9/15	Upper Missouri
20066	Iron City Island	**	255	1088	193	100	6/1 - 9/30	Upper Missouri
20070	Upper Two Calf	**	2763	11324	1866	95	6/16 - 10/30, 3/1 - 2/28	Two Calf

Allotment Number	Allotment Name	Allotment Totals				Percent Allotment in Monument	Grazing Season	Watershed Planning Area
		Acres	AUMs	Acres BLM Land	AUMs BLM Land			
20071	Reed Coulee	**	704	3614	577	70	5/1 - 10/31, 3/1 - 2/28	Two Calf
20075	Spring Coulee	2400	522	1639	358	100	6/10 - 10/20	AC/UR/WR
20078	Knox Ridge	**	**	11270	1629	95	5/16 - 12/15	Two Calf
20081	Stulc AMP	**	1010	4174	664	80	5/1 - 11/30, 3/1 - 2/28	AC/UR/WR
	South Side Allotments (Custodial Authorizations*)							
2003	Cimrhakl	1642	270	1642	270	100	custodial 3/1 - 2/28	Armells
2015	Komarek Ranch	125	19	125	19	35	custodial 3/1 - 2/28	Armells
2016	Komarek Place	519	102	519	102	15	custodial 3/1 - 2/28	Armells
9662	Mud Springs Coulee	800	97	800	97	100	custodial 3/1 - 2/28	Upper Missouri
9664	Big View	124	11	124	11	35	custodial 3/1 - 2/28	AC/UR/WR
9681	Sherry Coulee	160	23	160	23	100	custodial 3/1 - 2/28	Upper Missouri
9683	Coffee Creek	2471	261	2471	261	75	custodial 3/1 - 2/28	AC/UR/WR
9693	Dostal	1630	190	1630	190	70	custodial 3/1 - 2/28	AC/UR/WR
9714	Rattlesnake Coulee	1174	172	1174	172	60	custodal 3/1 - 2/28	Upper Missouri
9761	Arrow Ck Bench	2079	153	2079	153	50	custodial 3/1 - 2/28	AC/UR/WR
9767	Rowe Coulee	450	108	450	108	10	custodal 3/1 - 2/28	AC/UR/WR
9778	Deadman Coulee	2942	263	2942	263	10	custodial 3/1 - 2/28	AC/UR/WR
9802	Ritland	40	7	40	7	5	custodal 3/1 - 2/28	AC/UR/WR
9825	B Lazy M	252	41	252	41	5	custodal 3/1 - 2/28	AC/UR/WR
20002	Evers Bench	60	12	60	12	100	custodial 3/1 - 2/28	AC/UR/WR
20012	79 Coulee	40	10	40	10	100	custodial 3/1 - 2/28	AC/UR/WR
20079	Seventy-Nine Coulee	792	180	792	180	50	custodial 3/1 - 2/28	AC/UR/WR

* Custodial authorizations are for the recognized capacity of the BLM land regardless of the private or other lands fenced in the same pasture.

** These allotments have multiple pastures, some of which are authorized on a custodial basis and some are for a combination of lands.

*** AC/UR/WR = Arrow Creek / Upper River / Whiskey Ridge.

APPENDIX O
Oil and Gas

Appendix O contains three separate sections, as follows:

O.1 Oil and Gas Lease Stipulations and Conditions of Approval by Alternative 1331
O.2 Oil and Gas Board Orders 1363
O.3 Reasonable Foreseeable Development 1365

Appendix O.1

Oil and Gas Lease Stipulations and Conditions of Approval

This section of Appendix O provides the stipulations and conditions of approval that apply or would be applied to the oil and gas leases in the Monument under each alternative.

Alternative A (Current Management) Oil and Gas Lease Stipulations

West HiLine Oil and Gas Leases (12 Leases)

Twelve oil and gas leases were issued under the West HiLine Resource Management Plan (RMP) (Table O.1-1). These oil and gas leases include stipulations for a variety of resources should they be present on the lease during the permitting process (see Attachment O.1-1). The stipulations include: seasonal or distance restrictions to protect sage-grouse nesting areas, sage-grouse winter habitat, and big game winter range; controlled surface use to protect soils and visual resources; no surface occupancy to protect sage-grouse leks, designated sensitive species and streams and riparian/wetland areas. A notice is used to inform lessees and operators of the requirements for cultural resource historic preservation compliance.

Non-West HiLine Oil and Gas Leases (31 Leases)

Two oil and gas leases were issued with stipulations for a variety of resources, which are the same as those attached to the West HiLine leases (see Table O.1-1 and Attachment O.1-1).

Three oil and gas leases were issued with reasonable requirements/conditions for soil erosion, air and water pollution, and unnecessary damage to the surface vegetation. The stipulations also included no occupancy of the surface within specific distances from improved roads, highways, trails, and water sources (lakes, ponds, reservoirs, and springs) (see Table O.1-1 and Attachments O.1-2 and O.1-3).

Twenty-six oil and gas leases were issued without stipulations (see Table O.1-1).

Conditions of Approval

During the permitting process for applications for permits to drill (APDs), conditions of approval may also be applied to surface-disturbing activities consistent with the lease rights (Chapter 2, Table 2.24). These conditions would be considered on a case-by-case basis during the well onsite visit and review of the APD.

Alternative B Oil and Gas Conditions of Approval

In addition to the oil and gas lease stipulations addressed under Alternative A, the following conditions of approval would be applied to APDs on lease acreage in the Monument. (See Tables O.1-2 and O.1-3 at the end of this section.)

No Surface Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Leks

Condition of Approval: Surface disturbing and disruptive activities are prohibited within 1/4 mile of sage-grouse leks.

Objective: To protect sage-grouse lek sites necessary for the long-term maintenance of grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sage-grouse lek sites.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting sage-grouse lek sites, or if all lek sites within 1/4 mile of the area have not been used for 5 consecutive years.

Timing

Resource: Wildlife – Greater Sage-Grouse Nesting Zone

Condition of Approval: Surface disturbing and disruptive activities are prohibited from March 1 to June 15 in sage-grouse nesting habitat within 2 miles of a lek. This condition does not apply to the operation and maintenance of production facilities.

Table O.1-1
Oil and Gas Leases in the Monument

MTM Lease No.	*Lease Stipulations (Example)*	*Lease Date*	*Lease Acreage in the Monument*	*Lease Acreage outside the Monument*	*Total Lease Acreage*	*Lease Status - Actual, Allocated or No Production*
West HiLine Leases						
084559	Attachment O.1	11/1/1995	1,880	0	1,880	No Production
084560	Attachment O.1	11/1/1995	134	1,119	1,253	No Production
087212	Attachment O.1	9/1/1997	122	528	650	No Production
087658	Attachment O.1	2/1/1998	485	0	485	No Production
089082	Attachment O.1	5/1/1999	1,131	167	1,298	No Production
089452	Attachment O.1	11/1/1999	800	0	800	No Production
089469	Attachment O.1	11/1/1999	640	0	640	No Production
089473	Attachment O.1	11/1/1999	1,240	0	1,240	No Production
089474	Attachment O.1	11/1/1999	80	480	560	No Production
089475	Attachment O.1	12/1/1999	1,280	0	1,280	No Production
089476	Attachment O.1	12/1/1999	1,120	160	1,280	No Production
089482	Attachment O.1	11/1/1999	1,416	0	1,416	No Production
Subtotal			10,328	2,454	12,782	
Non-West HiLine Leases						
13821-A	None	11/1/1969	1,099	0	1,099	Actual
1903-B	None	6/1/1967	320	240	560	Actual
1565	None	5/1/1967	2,560	0	2,560	Actual/Allocated
1568	None	5/1/1967	2,320	240	2,560	Actual
1578	None	5/1/1967	575	1,988	2,563	Actual
1885	None	6/1/1967	40	611	651	Allocated
1886	None	6/1/1967	1,920	640	2,560	Actual
1888	None	6/1/1967	480	1,982	2,462	Actual
1903	None	6/1/1967	1,360	200	1,560	Allocated
1914	None	6/1/1967	200	440	640	Actual
2060	None	7/1/1967	640	0	640	Actual
2061	None	7/1/1967	640	0	640	Allocated
13816	None	11/1/1969	2,533	0	2,533	Actual
13818	None	11/1/1969	2,532	0	2,532	Allocated
13827	None	11/1/1969	1,156	0	1,156	Allocated
16098	None	9/1/1970	1,240	1,280	2,520	Allocated
16102	None	9/1/1970	1,506	163	1,669	Allocated
16103	None	9/1/1970	13	2,507	2,520	Actual
16327	None	10/1/1970	80	2,358	2,438	Actual/Allocated
16458	None	10/1/1970	688	1,272	1,960	Actual
16461	None	10/1/1970	2,547	0	2,547	Actual
16617	None	11/1/1970	490	929	1,419	Allocated
16618	None	11/1/1970	320	2,240	2,560	Actual/Allocated
16939	None	12/1/1970	2,530	0	2,530	Actual
17376	None	2/1/1971	40	80	120	Allocated
18274	Attachments O.1 & O.2	7/1/1971	1,367	1,160	2,527	Allocated
18282	Attachments O.1 & O.2	5/1/1973	851	1,680	2,531	Actual
18283	Attachments O.1 & O.2	5/1/1973	1,240	1,320	2,560	Actual/Allocated
19446	None	9/1/1971	110	1,113	1,223	Actual/Allocated
53751	Attachment O.1	6/1/1982	680	160	840	Actual
89460	Attachment O.1	11/1/1999	400	40	440	No Production
Subtotal			32,477	22,643	55,120	
Total			42,805	25,097	67,902	

Objective: To protect sage-grouse nesting habitat from disturbance during spring and early summer in order to maximize annual production of young, and to protect nesting activities adjacent to nesting sites for the long-term maintenance of sage-grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain sage-grouse nesting habitat within 2 miles of a lek. The dates for the timing restriction may be modified if new information indicates that the March 1 to June 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains sage-grouse nesting habitat within 2 miles of a lek.

Timing

Resource: Wildlife – Greater Sage-Grouse Winter Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter habitat for sage-grouse. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect sage-grouse winter habitat from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter habitat for sage-grouse. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter habitat for sage-grouse.

Controlled Surface Use

Resource: Wildlife – Designated Sensitive Species

Condition of Approval: Surface-disturbing and disruptive activities may be controlled or excluded within 200 meters of the activity or the activity delayed 60 days within identified habitat or active nests.

Objective: To maintain habitat for designated sensitive species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated. Seasonal exceptions may be allowed from August 1 through March 1 (the nonbreeding season for birds) if the authorized officer determines that the proposed activity will not disturb the production potential of designated sensitive species.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting designated sensitive species.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting designated sensitive species.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Black-tailed Prairie Dogs

Condition of Approval: Surface-disturbing and disruptive activities are prohibited on prairie dog towns.

Objective: To protect prairie dog colonies and habitat for associated species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting black-tailed prairie dogs.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting black-tailed prairie dogs.

Timing

Resource: Wildlife - Bald Eagle Nest Sites and Nesting Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1 mile of active winter roosting areas from November 15 to February 29, if disturbance could cause an adverse effect.

Surface disturbance is prohibited within 1 mile of active bald eagle nests from February 1 to July 31, if disturbance could cause nest abandonment or failure.

Objective: To protect bald eagle nesting sites and/or nesting habitat.

Exception: An exception may be granted by the authorized officer if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may or will have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the authorized officer.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Timing

Resource: Wildlife – Big Game Winter Range

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter range for mule deer, elk and antelope. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect elk, mule deer, and antelope winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter range for wildlife. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter range for wildlife.

Controlled Surface Use

Resource: Wildlife – Bighorn Sheep Distribution

Condition of Approval: Surface-disturbing and disruptive activities may be controlled or excluded within 200 meters of the activity or the activity delayed 60 days within bighorn sheep distribution areas.

Objective: To protect bighorn sheep during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep distribution.

Timing

Resource: Wildlife – Bighorn Sheep Lambing Areas

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from April 1 to June 15 within bighorn sheep lambing areas. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect bighorn sheep during the lambing season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep lambing areas. The dates for the timing restriction may be modified if new wildlife use information indicates that the April 15 to June 30 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep lambing areas.

No Surface-Disturbing Activities

Resource: Streams and Riparian/Wetland Areas

Condition of Approval: Surface-disturbing activities are prohibited within the channels of ephemeral, intermittent, and perennial streams, or within riparian and wetland areas.

Objective: To protect the unique biological and hydrological features associated with riparian and wetland areas.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include streams or riparian/wetland areas.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include streams or riparian/wetland areas.

Controlled Surface Use

Resource: Soils/Steep Slopes

Condition of Approval: Prior to surface-disturbing activities on slopes 30% and greater, a certified engineering and reclamation plan must be approved by the authorized officer. This plan must demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- The site and adjacent areas will be protected from accelerated erosion, such as rilling, gullying, piping, slope failure, and mass wasting.
- Nearby watercourses will be protected from sedimentation. Water quality and quantity will be in conformance with state and federal water quality laws.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Construction or reclamation will not be allowed when soils are frozen.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems.

Exception: None.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 30% and greater.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 30% and greater.

Controlled Surface Use

Resource: Visual Resource Management (VRM) Classes I, II, III and IV

Condition of Approval: All surface-disturbing activities, semi-permanent and permanent facilities in VRM Classes I, II, III, and IV areas may require special design including location, painting and camouflage to blend with the natural surroundings and meet the visual quality objectives for the area.

Objective: To control the visual impacts of activities and facilities within acceptable levels.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing Activities

Resource: Recreation

Condition of Approval: Surface-disturbing activities are prohibited within 300 feet of developed recreation areas and undeveloped recreation areas receiving concentrated public use.

Objective: To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified by the authorized officer if the recreation area boundaries are changed.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Controlled Surface Use

Resource: Historic Properties and/or Cultural Resources

Condition of Approval: The affected area may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect historic properties and/or other cultural resources.

Exception: None.

Modification: None.

Waiver: None.

Alternative C
Oil and Gas Conditions of Approval

In addition to the oil and gas lease stipulations addressed under Alternative A, the following conditions of approval would be applied to APDs on lease acreage in the Monument. (See Tables O.1-2 and O.1-3 at the end of this section.)

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Leks

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/4 mile of sage-grouse leks.

Objective: To protect sage-grouse lek sites necessary for the long-term maintenance of grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sage-grouse lek sites.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting sage-grouse lek sites, or if all lek sites within 1/4 mile of the area have not been used for 5 consecutive years.

Timing

Resource: Wildlife – Greater Sage-Grouse Nesting Zone

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from March 1 to June 15 in sage-grouse nesting habitat within 2 miles of a lek. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect sage-grouse nesting habitat from disturbance during spring and early summer in order to maximize annual production of young, and to protect nesting activities adjacent to nesting sites for the long-term maintenance of sage-grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain sage-grouse nesting habitat within 2 miles of a lek. The dates for the timing restriction may be modified if new information indicates that the March 1 to June 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains sage-grouse nesting habitat within 2 miles of a lek.

Timing

Resource: Wildlife – Greater Sage-Grouse Winter Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter habitat for sage-grouse. This

condition does not apply to the operation and maintenance of production facilities.

Objective: To protect sage-grouse winter habitat from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter habitat for sage-grouse. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter habitat for sage-grouse.

Controlled Surface Use

Resource: Wildlife – Black-tailed Prairie Dogs

Condition of Approval: Surface-disturbing and disruptive activities would be avoided, or minimized, on prairie dog towns.

Objective: To protect prairie dog colonies and habitat for associated species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting black-tailed prairie dogs.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting black-tailed prairie dogs.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Designated Sensitive Species

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within identified habitat or within 1/4 mile of active nests.

Objective: To maintain habitat for special status species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated. Seasonal exceptions may be allowed from August 1 through March 1 (the nonbreeding season for birds) if the authorized officer determines that the proposed activity will not disturb the production potential of special status species.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting special status species.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting special status species.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bald Eagle Nest Sites and Nesting Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/2 mile of known bald eagle nest sites that have been active within the past 7 years.

Objective: To protect bald eagle nesting sites and/or nesting habitat.

Exception: An exception may be granted by the authorized officer if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may or will have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the authorized officer.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Timing

Resource: Wildlife – Big Game Winter Range

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter range for mule deer, elk and antelope. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect mule deer, elk, and antelope winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter range for wildlife. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter range for wildlife.

Timing

Resource: Wildlife – Bighorn Sheep Distribution

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within bighorn sheep distribution areas. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect bighorn sheep during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep distribution.

Timing

Resource: Wildlife – Bighorn Sheep Lambing Areas

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from April 1 to June 15 within bighorn sheep lambing areas. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect bighorn sheep during the lambing season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep lambing areas. The dates for the timing restriction may be modified if new wildlife use information indicates that the April 1 to June 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep lambing areas.

No Surface-Disturbing Activities

Resource: Streams and Riparian/Wetland Areas

Condition of Approval: Surface-disturbing activities are prohibited within 1,000 feet of the channel of ephemeral, intermittent, and perennial streams, or within 1,000 feet of riparian and wetland areas.

Objective: To protect the unique biological and hydrological features associated with riparian and wetland areas and streams.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include streams or riparian areas.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include streams or riparian areas.

Controlled Surface Use

Resource: Soils/Steep Slopes

Condition of Approval: Prior to surface-disturbing activities on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils, a certified engineering and reclamation plan must be approved by the authorized officer. This plan must demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- The site and adjacent areas will be protected from accelerated erosion, such as rilling, gullying, piping, slope failure, and mass wasting.
- Nearby watercourses will be protected from sedimentation. Water quality and quantity will be in conformance with state and federal water quality laws.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Construction or reclamation will not be allowed when soils are frozen.

The operator must also provide an evaluation of past practices on similar terrain and be able to demonstrate success under similar conditions.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems.

Exception: None.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 30% and greater or severely erosive and/or slumping soils on 20% and greater slopes.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 30% and greater or severely erosive soils on 20% and greater slopes.

No Surface-Disturbing Activities

Resource: Soils/Steep Slopes

Condition of Approval: Surface-disturbing activities are prohibited on slopes 40% and greater.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems/failure.

Exception: The authorizing officer may grant an exception to this condition if the operator submits a certified engineering and reclamation plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated. This plan must demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- The site and adjacent areas will be protected from accelerated erosion, such as rilling, gullying, piping, slope failure, and mass wasting.
- Nearby watercourses will be protected from sedimentation. Water quality and quantity will be in conformance with state and federal water quality laws.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Construction or reclamation will not be allowed when soils are frozen.

The operator must also provide an evaluation of past practices on similar terrain and be able to demonstrate success under similar conditions.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 40% and greater.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 40% and greater.

Controlled Surface Use

Resource: VRM Class I

Condition of Approval: All surface-disturbing activities, semi-permanent and permanent facilities in VRM Class I will utilize 1) proper site selection; 2) reduction of soil and vegetative disturbance; 3) choice of color; and 4) over time, return the disturbed area to a seamless, natural landscape.

Objective: To reduce the visual contrast on BLM land in the existing landscape.

Exception: None.

Modification: None.

Waiver: None.

Controlled Surface Use

Resource: VRM Classes II and III

Condition of Approval: All surface-disturbing activities, semi-permanent and permanent facilities in VRM Classes II and III areas may require special design including location, painting and camouflage to blend with the natural surroundings and meet the visual quality objectives for the area.

Objective: To control the visual impacts of activities and facilities within acceptable levels.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing Activities

Resource: Recreation

Condition of Approval: Surface-disturbing activities are prohibited within the line of sight/sound or 300 feet (whichever is closer) of developed recreation areas and undeveloped recreation areas receiving concentrated public use. Work-over types of operations would be limited to weekdays, except for emergency situations when operations would be allowed.

Objective: To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified by the authorized officer if the recreation area boundaries are changed.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Controlled Surface Use

Resource: Historic Properties and/or Cultural Resources

Condition of Approval: The affected area may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect historic properties and/or other cultural resources.

Exception: None.

Modification: None.

Waiver: None.

Alternative D
Oil and Gas Conditions of Approval

In addition to the oil and gas lease stipulations addressed under Alternative A, the following conditions of approval would be applied to applications for permits to drill (APDs) on lease acreage in the Monument. (See Tables O.1-2 and O.1-3 at the end of this section.)

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Leks

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/4 mile of sage-grouse leks.

Objective: To protect sage-grouse lek sites necessary for the long-term maintenance of grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sage-grouse lek sites.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting sage-grouse lek sites, or if all lek sites within 1/4 mile of the area have not been used for 5 consecutive years.

Timing

Resource: Wildlife – Greater Sage-Grouse Nesting Zone

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from March 1 to June 15 in sage-grouse nesting habitat within 2 miles of a lek. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect sage-grouse nesting habitat from disturbance during spring and early summer in order to maximize annual production of young, and to protect nesting activities adjacent to nesting sites for the long-term maintenance of sage-grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain sage-grouse nesting habitat within 2 miles of a lek. The dates for the timing restriction may be modified if new information indicates that the March 1 to June 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains sage-grouse nesting habitat within 2 miles of a lek.

Timing

Resource: Wildlife – Greater Sage-Grouse Winter Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter habitat for sage-grouse. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect sage-grouse winter habitat from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter habitat for sage-grouse. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter habitat for sage-grouse.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Black-tailed Prairie Dogs

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/4 mile of prairie dog towns if an activity would adversely impact prairie dogs and/or associated species.

Objective: To protect prairie dog colonies and habitat for associated species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting black-tailed prairie dogs.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting black-tailed prairie dogs.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Designated Sensitive Species

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within identified habitat and within 1/4 mile of active nests.

Objective: To maintain habitat for special status species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the

proposed action are acceptable or can be adequately mitigated. Seasonal exceptions may be allowed from August 1 through March 1 (the nonbreeding season for birds) if the authorized officer determines that the proposed activity will not disturb the production potential of special status species.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting special status species.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting special status species.

Timing

Resource: Wildlife – Designated Sensitive Species

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from March 1 to August 1 within 1/4 mile of active nests.

Objective: To maintain habitat for special status species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of designated sensitive species.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting the production potential of designated sensitive species.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bald Eagle Nest Sites and Nesting Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/2 mile of known bald eagle nest sites that have been active within the past 7 years and within riparian area nesting habitat.

Objective: To protect bald eagle nesting sites and/or nesting habitat.

Exception: An exception may be granted by the authorized officer if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may or will have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the authorized officer.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Timing

Resource: Wildlife – Big Game Winter Range

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to May 15 within winter range for mule deer, elk and antelope. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect mule deer, elk, and antelope winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter range for wildlife. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to May 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter range for wildlife.

Timing

Resource: Wildlife – Bighorn Sheep Distribution

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within bighorn sheep distribution areas. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect bighorn sheep during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep distribution.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bighorn Sheep Lambing Areas

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within bighorn sheep lambing areas. This condition does not apply to the operation and maintenance of production facilities.

Objective: To protect bighorn sheep and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep lambing areas.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep lambing areas.

No Surface-Disturbing Activities

Resource: Streams and Riparian/Wetland Areas

Condition of Approval: Surface-disturbing activities are prohibited within 1/4 mile of the channels of ephemeral, intermittent, and perennial streams, or within 1/4 mile of the outer margins of riparian and wetland areas.

Objective: To protect the unique biological and hydrological features associated with riparian and wetland areas.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include streams or riparian/wetland areas.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include streams or riparian/wetland areas.

Controlled Surface Use

Resource: Soils/Steep Slopes

Condition of Approval: Prior to surface-disturbing activities on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils, a certified engineering and reclamation plan must be approved by the authorized officer. This plan must demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- The site and adjacent areas will be protected from accelerated erosion, such as rilling, gullying, piping, slope failure, and mass wasting.
- Nearby watercourses will be protected from sedimentation. Water quality and quantity will be in conformance with state and federal water quality laws.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Construction or reclamation will not be allowed when soils are frozen.

The operator must also provide an evaluation of past practices on similar terrain and be able to demonstrate success under similar conditions.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems.

Exception: None.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 30% and greater or severely erosive and/or slumping soils on 20% and greater slopes.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 30% and greater or severely erosive and/or slumping soils on 20% and greater slopes.

No Surface-Disturbing Activities

Resource: Soils/Steep Slopes

Condition of Approval: Surface-disturbing activities are prohibited on slopes 40% and greater. This applies to locations, facilities and roads.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems/failure.

Exception: None.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 40% and greater.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 40% and greater.

No Surface-Disturbing Activities

Resource: VRM Class I

Condition of Approval: Surface-disturbing activities are prohibited in VRM Class I areas.

Objective: To reduce the visual contrast on BLM land in the existing landscape.

Exception: None.

Modification: None.

Waiver: None.

Controlled Surface Use

Resource: VRM Class II

Condition of Approval: All surface-disturbing activities, semi-permanent and permanent facilities in VRM Class II will utilize 1) proper site selection; 2) reduction of soil and vegetative disturbance; 3) choice of color; and 4) over time, return the disturbed area to a seamless, natural landscape.

Objective: To control the visual impacts of activities and facilities within acceptable levels.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing Activities

Resource: Recreation

Condition of Approval: Surface-disturbing activities are prohibited within the line of sight/sound or 300 feet (whichever is closer) of developed recreation areas and undeveloped recreation areas receiving concentrated public use. Work-over types of operations, like well fraccing or maintenance, would be limited to Tuesdays, Wednesdays, and Thursdays.

Objective: To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified by the authorized officer if the recreation area boundaries are changed.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Controlled Surface Use

Resource: Historic Properties and/or Cultural Resources

Condition of Approval: The affected area may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable

requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect historic properties and/or other cultural resources.

Exception: None.

Modification: None.

Waiver: None.

Alternative E
Oil and Gas Conditions of Approval

Under Alternative E, surface occupancy and use would be prohibited on all 12 West HiLine oil and gas leases. This would include the entire leasehold (both in and outside of the Monument).

The following conditions of approval would apply to the 31 non-West HiLine oil and gas leases (only the lease acreage in the Monument). (See Tables O.1-2 and O.1-3 at the end of this section.)

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Leks

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 2 miles of sage-grouse leks.

Objective: To protect sage-grouse lek sites necessary for the long-term maintenance of grouse populations in the area.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Nesting Zone

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 2 miles of sage-grouse leks.

Objective: To protect sage-grouse nesting habitat from disturbance in order to maximize annual production of young, and to protect nesting activities adjacent to nesting sites for the long-term maintenance of sage-grouse populations in the area.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Winter Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within winter habitat for sage-grouse.

Objective: To protect sage-grouse winter habitat from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Black-tailed Prairie Dogs

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/4 mile of prairie dog towns.

Objective: To protect prairie dog colonies and habitat for associated species.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Designated Sensitive Species

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within identified habitat and within 1/2 mile of active nests.

Objective: To maintain habitat for designated sensitive species.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bald Eagle Nest Sites and Nesting Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/2 mile of known bald eagle nest sites that have been active within the past 7 years and within riparian area nesting habitat.

Objective: To protect bald eagle nesting sites and/or nesting habitat.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Big Game Winter Range

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within winter range for elk, mule deer, and antelope.

Objective: To protect elk, mule deer, and antelope winter range from disturbance and to facilitate long-term maintenance of wildlife populations.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bighorn Sheep Distribution

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within bighorn sheep distribution areas.

Objective: To protect bighorn sheep and to facilitate long-term maintenance of wildlife populations.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bighorn Sheep Lambing Areas

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1 mile of bighorn sheep lambing areas, if such activities would adversely impact lamb survival.

Objective: To protect bighorn sheep and to facilitate long-term maintenance of wildlife populations.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing Activities

Resource: Streams and Riparian/Wetland Areas

Condition of Approval: Surface-disturbing activities are prohibited within 1/4 mile of the channels of ephemeral, intermittent, and perennial streams, or within 1/4 mile of the outer margins of riparian and wetland areas.

Objective: To protect the unique biological and hydrological features associated with steams and riparian/wetland areas.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing Activities

Resource: Soils/Steep Slopes

Condition of Approval: Surface-disturbing activities are prohibited on slopes 20% and greater.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or reclamation failure.

Exception: None.

Modification: None.

Waiver: None.

No Surface-Disturbing Activities

Resource: VRM Classes I and II

Condition of Approval: Surface-disturbing activities are prohibited in VRM Class I and II areas.

Objective: To reduce the visual contrast on BLM land in the existing landscape.

Exception: None.

Modification: None.

Waiver: None.

No Surface Disturbance

Resource: Recreation

Condition of Approval: Surface-disturbing activities are prohibited within the line of sight/sound or 300 feet (whichever is closer) of developed recreation areas and undeveloped recreation areas receiving concentrated public use. Work-over types of operations, like well fraccing or maintenance, would be limited to Tuesdays, Wednesdays, and Thursdays.

Objective: To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.

Exception: None.

Modification: None.

Waiver: None.

Controlled Surface Use

Resource: Historic Properties and/or Cultural Resources

Condition of Approval: The affected area may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect historic properties and/or other cultural resources.

Exception: None.

Modification: None.

Waiver: None.

Alternative F (Preferred Alternative) Oil and Gas Conditions of Approval

In addition to the oil and gas lease stipulations addressed under Alternative A, the following conditions of approval would be applied to applications for permits to drill (APDs) on lease acreage in the Monument. (See Tables O.1-2 and O.1-3 at the end of this section.)

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Greater Sage-Grouse Leks

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/4 mile of sage-grouse leks.

Objective: To protect sage-grouse lek sites necessary for the long-term maintenance of grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified (decreased or increased) if the authorized officer determines that portions of the area can be occupied without adversely affecting sage-grouse lek sites or if the authorized officer determines a greater distance is needed to protect the lek based on new research and studies.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting sage-grouse lek sites, or if all lek sites within 1/4 mile of the area have not been used for 5 consecutive years.

Timing

Resource: Wildlife – Greater Sage-Grouse Nesting Zone

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from March 1 to June 15 in sage-grouse nesting habitat within 2 miles of a lek. Travel on identified designated roads may include these timing restrictions or limited site visits.

Objective: To protect sage-grouse nesting habitat from disturbance during spring and early summer in order to

maximize annual production of young, and to protect nesting activities adjacent to nesting sites for the long-term maintenance of sage-grouse populations in the area.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain sage-grouse nesting habitat within 2 miles of a lek. The dates for the timing restriction may be modified if new information indicates that the March 1 to June 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains sage-grouse nesting habitat within 2 miles of a lek.

Timing

Resource: Wildlife – Greater Sage-Grouse Winter Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter habitat for sage-grouse. This condition does not apply to the operation and maintenance of production facilities. Travel on identified designated roads may include these timing restrictions or limited site visits.

Objective: To protect sage-grouse winter habitat from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter habitat for sage-grouse. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter habitat for sage-grouse.

Controlled Surface Use

Resource: Wildlife – Black-tailed Prairie Dogs

Condition of Approval: Surface-disturbing and disruptive activities may be controlled or excluded within 1/4 mile of prairie dog towns, if an activity would adversely impact prairie dogs and/or associated species.

Objective: To protect prairie dog colonies and habitat for associated species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting black-tailed prairie dogs.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting black-tailed prairie dogs.

Controlled Surface Use

Resource: Wildlife – Designated Sensitive Species

Condition of Approval: Surface-disturbing and disruptive activities may be controlled or excluded within 1/4 mile of the activity or the activity delayed 90 days within identified habitat or active nests.

Objective: To maintain habitat for designated sensitive species.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated. Seasonal exceptions may be allowed from August 1 through March 1 (the nonbreeding season for birds) if the authorized officer determines that the proposed activity will not disturb the production potential of designated sensitive species.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting designated sensitive species.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting designated sensitive species.

Timing

Resource: Wildlife – Ferruginous Hawk

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from March 1 to August 1 within 1/2 mile of active ferruginous hawk nest sites.

Objective: To maintain the production potential of ferruginous hawk nest sites.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated. Seasonal exceptions may be allowed from August 1 through March 1 (the nonbreeding season) if the authorized officer determines that the proposed activity will not disturb the production potential of ferruginous hawk nest sites.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of ferruginous hawk nest sites.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting the production potential of ferruginous hawk nest sites.

No Surface-Disturbing or Disruptive Activities

Resource: Wildlife – Bald Eagle Nest Sites and Nesting Habitat

Condition of Approval: Surface-disturbing and disruptive activities are prohibited within 1/2 mile of known bald eagle nest sites that have been active within the past 7 years, if disturbance could cause nest abandonment or failure.

Objective: To protect bald eagle nesting sites and/or nesting habitat.

Exception: An exception may be granted by the authorized officer if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may or will have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the authorized officer.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Waiver: This condition may be waived if the authorized officer determines that the affected area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.

Timing

Resource: Wildlife – Big Game Winter Range

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within winter range for mule deer, elk and antelope. Travel on identified designated roads may include these timing restrictions or limited site visits.

Objective: To protect mule deer, elk, and antelope winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain winter range for wildlife. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains winter range for wildlife.

Timing

Resource: Wildlife – Bighorn Sheep Distribution

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from December 1 to March 31 within bighorn sheep distribution areas. Travel on identified designated roads may include these timing restrictions or limited site visits.

Objective: To protect bighorn sheep during the winter use season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the

proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep. The dates for the timing restriction may be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep distribution.

Timing

Resource: Wildlife – Bighorn Sheep Lambing Areas

Condition of Approval: Surface-disturbing and disruptive activities are prohibited from April 1 to June 15 within bighorn sheep lambing areas. Travel on identified designated roads may include these timing restrictions or limited site visits.

Objective: To protect bighorn sheep during the lambing season, and to facilitate long-term maintenance of wildlife populations.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain bighorn sheep lambing areas. The dates for the timing restriction may be modified if new wildlife use information indicates that the April 1 to June 15 dates are not valid for the area.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains bighorn sheep lambing areas.

No Surface-Disturbing Activities

Resource: Streams, Riparian/Wetland Areas, and 100-Year Floodplains

Condition of Approval: Surface-disturbing activities are prohibited within 100-year floodplains or within 500 feet of the channels of ephemeral, intermittent, and perennial streams, or within 500 feet of the outer margins of riparian and wetland areas.

Objective: To protect the unique biological and hydrological features associated with steams, riparian/wetland areas, and 100-year floodplains. Given the landform and topography in the lease locations within the Monument, the 100-year floodplain is easily encompassed by the 500 foot distance from the channels of ephemeral, intermittent, and perennial streams or the outer margins of riparian and wetland areas.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated. Mitigation may include a bunker or dual-walled drum to prevent/contain any potential spill. An exception may also be allowed when the surface of the site is 20 feet higher than the channel (out of the floodplain).

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include riparian/wetland areas.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include streams or riparian/wetland areas.

Controlled Surface Use

Resource: Soils/Steep Slopes

Condition of Approval: Prior to surface-disturbing activities on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils, a certified engineering and reclamation plan must be approved by the authorized officer. This plan must demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- The site and adjacent areas will be protected from accelerated erosion, such as rilling, gullying, piping, slope failure, and mass wasting.
- Nearby watercourses will be protected from sedimentation. Water quality and quantity will be in conformance with state and federal water quality laws.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Construction or reclamation will not be allowed when soils are frozen.

The operator must also provide an evaluation of past practices on similar terrain and be able to demonstrate success under similar conditions.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems.

Exception: None.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 30% and greater or severely erosive and/or slumping soils on 20% and greater slopes.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 30% and greater or severely erosive and/or slumping soils on 20% and greater slopes.

No Surface-Disturbing Activities

Resource: Soils/Steep Slopes

Condition of Approval: Surface-disturbing activities are prohibited on slopes 40% and greater.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, and/or having excessive reclamation problems/failure.

Exception: The authorizing officer may grant an exception to this condition for short distances (less than 300 feet) for pipelines if the operator submits a certified engineering and reclamation plan that clearly demonstrates impacts from the proposed actions are acceptable or can be adequately mitigated. This plan must include and demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- The site and adjacent areas will be protected from accelerated erosion, such as rilling, gullying, piping, and slope failure and mass wasting.
- Nearby water sources will be protected from sedimentation. Water quality and quantity will be in conformance with state and federal water quality laws.
- Site-specific analysis of soil physical, chemical and mechanical (engineering) properties and behavior will be conducted.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Reclamation will not be allowed when soils are frozen.

The operator must also provide an evaluation of past practices on similar terrain and be able to demonstrate success under similar conditions.

Modification: The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include slopes 40% and greater.

Waiver: This condition may be waived by the authorized officer if it is determined that the affected area does not include slopes 40% and greater.

No Surface-Disturbing Activities

Resource: VRM Class I

Condition of Approval: Surface-disturbing activities are prohibited in VRM Class I areas.

Objective: To reduce the visual contrast on BLM land in the existing landscape.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated through special design including location, painting and camouflage to blend with the natural surroundings.

Modification: None.

Waiver: None.

Controlled Surface Use

Resource: VRM Classes II, III and IV

Condition of Approval: All surface-disturbing activities, semi-permanent and permanent facilities in VRM Classes II, III and IV will utilize 1) proper site selection; 2) reduction of soil and vegetative disturbance; 3) choice of color; and 4) over time, return the disturbed area to a seamless, natural landscape.

Objective: To control the visual impacts of activities and facilities within acceptable levels.

Exception: None.

Modification: None.

Waiver: None.

No Surface Disturbance

Resource: Recreation

Condition of Approval: Surface-disturbing activities are prohibited within the line of sight/sound or 300 feet (whichever is closer) of developed recreation areas (Level 1, 2, and 3 sites) and undeveloped recreation areas receiving concentrated public use. Work-over types of operations would be limited to weekdays, except for emergency situations when operations would be allowed.

Objective: To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.

Exception: An exception to this condition may be granted by the authorized officer if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the affected area may be modified by the authorized officer if the recreation area boundaries are changed.

Waiver: This condition may be waived if the authorized officer determines that the affected area no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Controlled Surface Use

Resource: Historic Properties and/or Cultural Resources

Condition of Approval: The affected area may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect historic properties and/or other cultural resources.

Exception: None.

Modification: None.

Waiver: None.

Table O.1-2
Oil and Gas Leases in the Monument and Affected Resources (Wildlife and Water)
(acres)

MTM Lease No.	Lease Acreage in the Monument	Greater Sage-Grouse			Black-tailed Prairie Dogs	Sensitive Species		Mule Deer Winter Range	Elk Winter Range	Antelope Winter Range	Bighorn Sheep Dist.	Bighorn Sheep		Streams		
		1/4 Mile Lek	2 Miles Nesting Area	Winter Habitat		1/4 Mile	1/2 Mile					Lambing Area	1-Mile Buffer	500'	1,000'	1/4 Mile
West HiLine Leases																
084559	1,880		105	26				1,880	1,880	494				464	870	1,103
084560	134		114	78				134	134	134				29	67	90
087212	122		24	128				122	122	122				44	90	110
087658	485							485			485	485	485	82	145	192
089082	1,131		503	723				1,131	1,131	1,131				223	448	598
089452	800				72			800			575	408	655	239	416	498
089469	640		545					640	640	539				237	414	511
089473	1,240							1,240	392		606	5	769	400	686	828
089474	80						15	80	80	8					2	3
089475	1,280							1,280	1,280	473				371	710	887
089476	1,120							1,120	1,120	226						
089482	1,416					3	56	1,416		677	1,414	161	1,283	214	491	672
Subtotal	10,328		1,291	955	72	3	71	10,328	6,779	3,804	3,080	1,059	3,192	2,303	4,339	5,492
Non-West HiLine Leases																
1565	2,560	31	2,530	30				2,560	2,560	1,756				536	1,048	1,397
1568	2,320		956	567				2,320	2,320	1,539				569	1,098	1,394
1578	575		448					575	575	575				271	453	519
1885	40			14				40	40							
1886	1,920			10				1,920	1,920	56				628	1,045	1,201
1888	480			125				480	480					121	218	262
1903	1,360							1,360	1,360	500				125	259	370
1903-B	320		2					320	320	130				117	201	234
1914	200						28	200	200							
2060	640							640	33		471	321	521	66	130	173
2061	640							640			528	210	611	113	189	242
13816	2,533							2,533	2,520	1,861	1,545		197	32	129	236

Table O.1-2
Oil and Gas Leases in the Monument and Affected Resources (Wildlife and Water)
(acres)

MTM Lease No.	Lease Acreage in the Monument	Greater Sage-Grouse			Black-tailed Prairie Dogs	Sensitive Species		Mule Deer Winter Range	Elk Winter Range	Antelope Winter Range	Bighorn Sheep Dist.	Bighorn Sheep		Streams		
		1/4 Mile Lek	2 Miles Nesting Area	Winter Habitat		1/4 Mile	1/2 Mile					Lambing Area	1-Mile Buffer	500'	1,000'	1/4 Mile
13818	2,532					1	58	2,532				1,036	2,196	401	734	933
13821-A	1,099					122	396	1,099			1,099	1,099	1,099			1
13827	1,156							1,156	206		1,099	531	948	400	638	762
16098	1,240						1	1,240	1,240		1,154			379	750	939
16102	1,506		52	33			24	1,506	1,506	284				423	753	938
16103	13		7	13				13	13	13						
16327	80							80								
16458	688		88	27				688	688	126				80	161	217
16461	2,547					125	460	2,547	2,547	125				634	1,129	1,422
16617	490					4	64	490			441	110	378	129	258	308
16618	320							320						156	255	276
16939	2,530					125	480	2,530	2,530	37	318			590	1,112	1,397
17376	40							40						2	23	38
18274	1,367					155	606	1,367			1,367	1,037	1,367	120	249	336
18282	851							851	215		851	741	851	210	386	483
18283	1,240							1,240	1,240	2	1,223	100	1,133	374	662	767
19446	110							110								
53751	680							680	680	35	672	225	661	21	77	152
89460	400							400	130		396	94	396	121	214	262
Subtotal	32,477	31	4,083	819		532	2,117	32,477	23,323	7,039	11,164	5,504	10,358	6,618	12,171	15,259
Total	42,805	31	5,374	1,774	72	535	2,188	42,805	30,102	10,843	14,244	6,563	13,550	8,921	16,510	20,751

Table O.1-3
Oil and Gas Leases in the Monument and Affected Resources (Soils/Slope and VRM)
(acres)

MTM Lease No.	Lease Acreage in the Monu-ment	Soils/Slope				Alternatives A and B				Alternative C				Alternatives D and E		Alternative F (Preferred Alternative)			
		20% and >				VRM Class				VRM Class				VRM Class		VRM Class			
			K- .32 and >	30% and >	40% and >	I	II	III	IV	I	II	III	IV	I	II	I	II	III	IV
West HiLine Leases																			
084559	1,880	170	170	20	1		1,784		96		1,784	39	57		1,880		1,784	39	57
084560	134						38		96		38		96		134		38		96
087212	122								122			94	28		122			94	28
087658	485	323	238	164	61				485		485			16	469	16	469		
089082	1,131	19	19				19		1,112		19	529	583		1,131		19	529	583
089452	800	454	449	315	223				800			684	116		800			638	162
089469	640	197	197	35	1		588		52		640				640		640		
089473	1,240	788	384	468	210				1,240		1,180		60		1,240		1,180		60
089474	80	6	6	1			80				80				80		80		
089475	1,280	323	270	109	26		1,280				1,280				1,280		1280		
089476	1,120	124	124	25	4				1,120		624	220	276		1,120		624	220	276
089482	1,416	995	516	546	227	92			1,324	92	1,324			92	1,324	92	1324		
Subtotal	10,328	3,399	2,373	1,683	753	92	3,789		6,447	92	7,454	1,566	1,216	108	10,220	108	7,438	1,520	1,262
Non-West HiLine Leases																			
1565	2,560	275	275	69	12		2,250		310		2,264	296			2,560		2,264	296	
1568	2,320	126	123	13			1,319		1,001		1,319	576	425		2,320		1,319	576	425
1578	575	220	220	82	19		147		428		147	428			575		147	428	
1885	40	14	14	7			40				40				40		40		
1886	1,920	439	439	92	14		1,920				1,920				1,920		1,920		
1888	480	69	69	6			480				480				480		480		
1903	1,360	166	166	14			1,360				1,360				1,360		1360		
1903-B	320	117	117	32	11		320				320				320		320		
1914	200	1	1				200				200				200		200		
2060	640	298	298	155	82				640		439		201	39	601	39	439		162

Table O.1-3
Oil and Gas Leases in the Monument and Affected Resources (Soils/Slope and VRM)
(acres)

MTM Lease No.	Lease Acreage in the Monu-ment	Soils/Slope				Alternatives A and B				Alternative C				Alternatives D and E		Alternative F (Preferred Alternative)			
		20% and >				VRM Class				VRM Class				VRM Class		VRM Class			
			K- .32 and >	30% and >	40% and >	I	II	III	IV	I	II	III	IV	I	II	I	II	III	IV
2061	640	401	401	232	120				640		439		201	150	490	150	437		53
13816	2,533	746	734	271	63				2,533		1,965	68	500		2,533		1,965	68	500
13818	2,532	1,191	1,191	655	344				2,532	860	926	746		860	1,672	860	926	109	637
13821-A	1,099	767	767	473	235	70			1,029	70	1,029			71	1,028	71	1028		
13827	1,156	757	757	475	251	13			1,143	13	1,143			13	1,143	13	1143		
16098	1,240	342	342	131	35		1,081		159		1,101	1	138	392	848	392	710	1	137
16102	1,506	419	417	147	41		297		1,209		967	539			1,506		967	539	
16103	13						13				13				13		13		
16327	80	46	46	22	7		80				80				80		80		
16458	688	135	135	32	3		688				688				688		688		
16461	2,547	1,073	1,073	354	66				2,547		2,119	393	35		2,547		2,119	393	35
16617	490	262	131	154	89		490				490				490		490		
16618	320	220	220	137	70		320				320				320		320		
16939	2,530	916	916	277	28		2,190		340		2,488		42		2,530		2,487		43
17376	40	22	22	9	3		40				40				40		40		
18274	1,367	859	408	585	406	309	1,058			309	1,058			309	1,058	309	1058		
18282	851	537	248	354	241	463	388			463	388			463	388	463	388		
18283	1,240	655	655	324	147	374	866			374	866			374	866	374	866		
19446	110	26	16	10	4				110			110			110			110	
53751	680	323	323	137	45	157	523			157	523			157	523	157	523		
89460	400	194	163	103	63		400				400				400		400		
Subtotal	32,477	11,616	10,687	5,352	2,399	1,386	16,470		14,621	2,246	25,532	3,157	1,542	2,828	29,649	2,828	25,137	2,520	1,992
Total	42,805	15,015	13,060	7,035	3,152	1,478	20,259		21,068	2,338	32,986	4,723	2,758	2,936	39,869	2,936	32,575	4,040	3,254

Attachment O.1-1

Oil and Gas Lease Stipulations (Form 3109-1 and Standard Stipulations)

Esthetics – To maintain esthetic values, all surface-disturbing activities, semi-permanent and permanent facilities may require special design including location, painting and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of the surface management agency.

Erosion Control – Surface-disturbing activities may be prohibited during muddy and/or wet soil periods. This limitation does not apply to operation and maintenance of producing wells using authorized roads.

Controlled or Limited Surface Use Stipulation – This stipulation may be modified by special stipulations which are hereto attached or when specifically approved in writing by the Bureau of Land Management with concurrence of the surface management agency. Distances and/or time periods may be made less restrictive depending on the actual onground conditions. The prospective lessee should contact the surface management agency for more specific locations and information regarding the restrictive nature of this stipulation.

The lessee/operator is given notice that the lands within this lease may include special areas and that such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled, or if absolutely necessary, excluded. Use or occupancy will be restricted only when the Bureau of Land Management and/or the surface management agency demonstrates the restriction necessary for the protection of such special areas and existing or planned uses. Appropriate modifications to imposed restrictions will be made for the maintenance and operations of producing oil and gas wells.

After the surface management agency has been advised of specific proposed surface use or occupancy on the leased lands, and on request of the lessee/operator, the Agency will furnish further data on any special areas which may include:

100 feet from the edge of the rights-of-way from highways, designated county roads and appropriate federally-owned or controlled roads and recreation trails.

500 feet, or when necessary, within the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams; 1,000 feet, or when necessary, within the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies.

500 feet from grouse strutting grounds. Special care to avoid nesting areas associated with strutting grounds will be necessary during the period from March 1 to June 30. One-fourth mile from identified essential habitat of state and federal sensitive species. Wildlife winter ranges during the period from December 1 to May 15, and in elk calving areas, during the period from May 1 to June 30.

300 feet from occupied buildings, developed recreational areas, undeveloped recreational areas receiving concentrated public use and sites eligible for or designated as National Register sites.

Seasonal road closures, roads for special uses, specified roads during heavy traffic periods and on areas having restrictive off-road vehicle designations.

On slopes over 30%, or 20% on extremely erodable or slumping soils.

Notice for Cultural and Paleontological Resources – The federal surface management agency is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation

measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the surface management agency, shall:

1. Contact the appropriate surface management agency to determine if a site-specific cultural resource inventory is required. If an inventory is required, then;

2. Engage the services of a cultural resource specialist acceptable to the surface management agency to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the area of proposed disturbance to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the surface management agency for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

3. Implement mitigation measures required by the surface management agency. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as testing salvage and recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the surface management agency, surface occupancy on that area must be prohibited.

The lessee or operator shall immediately bring to the attention of the surface management agency any cultural or paleontological resources discovered as a result of approved operations under this lease, and not disturb such discoveries until directed to proceed by the surface management agency.

Notice for Endangered or Threatened Species – The surface management agency is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species, listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1983 by detrimentally affecting endangered or threatened species or their habitats.

The lessee/operator may, unless notified by the authorized officer of the surface management agency that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resources specialist approved by the surface management agency. An acceptable report must be provided to the surface management agency identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.

Attachment O.1-2

Oil and Gas Lease Stipulations (Forms 3100-11 and 3100-28)

The lessee hereby agrees the following stipulations are part of the lease terms:

A. At least two weeks prior to entry on the land for purposes of field operations, including seismic work, the lessee must advise the District Manager, Bureau of Land Management and after consultation prepare a "Surface Management Plan." The final plan shall be prepared in duplicate, including maps, for approval by the District Manager. Such approval will be conditioned on reasonable requirements needed to prevent soil erosion, air and water pollution, unnecessary damages to the surface vegetation and other resources of the United States and to provide for the restoration of the land surface and vegetation. The plan shall contain all such provisions as the Bureau of Land Management may deem necessary to maintain proper management of the lands and resources within the operating area.

The plan will contain the following items:

1. The location, construction specifications, maintenance program, and estimated use by the lessee, his employees and agents, of all access and work roads.

2. The methods to be used in the operations, including disposal of waste material.

3. The size and location of all structures and facilities to be constructed.

4. The location and size of areas upon which vegetation will be destroyed and/or soil laid bare and the steps which will be taken to prevent and control soil erosion thereon, including but not limited to the proposed program for rehabilitation and revegetation of these disturbed lands both during and upon cessation of operations.

5. The steps which will be taken to prevent water and air pollution.

6. The character, amount, and time of use of explosives or fire, including safety precautions which will be taken during their use.

7. Provisions for protecting permitted livestock and wildlife.

B. Prior to seismic field operations, if the lessee does not have appropriate bonding coverage, it will be necessary for him to furnish an Oil and Gas Exploration Bond (43 CFR sec. 3104.9).

If later operations require departure from or additions to the approved plan, these revisions or amendments, together with justification statement for proposed revisions, will be submitted to the District Manager for approval.

Any and all operations conducted in advance of approval of an original, revised or amended operating plan, or which are not in accord with an approved plan, constitute a violation of the terms of this lease and the Bureau of Land management reserves the right to close down the operation until such corrective action, as is deemed necessary, is taken by the lessee.

C. No occupancy of the surface of the areas described in items 1 through 4 below is authorized by this lease. The lessee is, however, authorized to employ directional drilling to develop the mineral resources under these areas provided that such drilling or other works will not disturb the surface area or otherwise interfere with their use by the Bureau of Land Management. It is understood and agreed that the use of these areas for public purposes is superior to any other use. Areas to be excluded from direct drilling occupancy are:

1. Within 660 feet on either side of the right-of-way boundary of any and all improved roads and/or highways within the lease areas.

2. Within 100 feet on either side of the centerline of any and all trails within the lease area.

3. Within 300 feet of the normal high water line of any and all lakes, ponds, and reservoirs located within the lease area.

4. Within 300 feet of any and all springs or water wells within the lease area.

The distances in subparagraphs 1, 2, 3, and 4, immediately above, may be reduced when specifically agreed to in the "Surface Management Plan."

No access or work trail, earth cut or fill, structure development, facility or any other improvement of a permanent nature will be permitted if it can be viewed from the high water surface of the Missouri River.

Attachment O.1-3

Oil and Gas Lease Stipulations
(Form 3100-24)

1. Notwithstanding any provision of this lease to the contrary, any drilling, construction or other operation on the leased lands that will disturb the surface thereof or otherwise affect the environment (hereinafter called "surface disturbing operations"), conducted by lessee, shall be subject, as set forth in this stipulation, to the prior approval of such operation by the Area Oil and Gas Supervisor, in consultation with the appropriate surface management agency and to such reasonable conditions not inconsistent with the purposes for which this lease is issued, as the Supervisor may require to protect the surface of the leased lands and the environment.

2. Prior to entry upon the land or the disturbance of the surface thereof for drilling or other purposes, the lessee shall submit for approval two copies of a map and explanation of the nature of the anticipated activity and surface disturbance.

An environmental analysis will be made by the Geological Survey, in consultation with the appropriate surface management agency, for the purpose of insuring proper protection of the surface, the natural resources, the environment, existing improvements and for assuring timely reclamation of disturbed lands.

3. Upon completion of said environmental analysis, the Area Oil and Gas Supervisor shall notify lessee of the conditions, if any, to which the proposed surface disturbing operations will be subject. Said conditions may relate to any of the following:

   (a) The location of drilling or other exploratory or developmental operations or the manner in which they are conducted;

   (b) The type of vehicles that may be used and the areas in which they may be used; and

   (c) The manner or location in which the improvements, such as roads, buildings, pipelines or other improvements are to be constructed.

Appendix O.2

Oil and Gas Board Orders

Table O.2-1
Leroy Field Board Orders

Board Order (Approval Date)	*Area Covered by Order*	*Geologic Formation Covered by Order*	*Spacing or Exception to State Spacing Regulations*
1975-19 (4-17-1975)	T23N-R18E Sections 1-36 T23N-R19E Sections 1-36 T24N-R18E Sections 7-36 T24N-R19E Sections 7-36	Judith River Eagle-Virgelle	Leroy Field Delineated at 320 acre spacing.
1975-39 (10-16-1975)	T24N-R19E NE¼NE¼ Section 21	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1978-42 (8-3-1978)	T24N-R18E SW¼NW¼ Section 30	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1979-11 (2-15-1979)	T24N-R19E NE¼NE¼ Section 21	Judith River Eagle-Virgelle	Well Location Re-survey
1979-56 (8-2-1979)	T24N-R19E NW¼NW¼ Section 26	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1980-72 (7-31-1980)	T23N-R18E SW¼SW¼ Section 3	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1981-95 (7-31-1981)	T24N-R18E SE¼SW¼ Section 11	Judith River Eagle-Virgelle	Exception Location to Board Orders 1975-19 and 1980-72
1985-43 (7-24-1985)	T23N-R19E NW¼SW¼ Section 28	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1987-31 (8-13-1987)	T24N-R20E Sections 1-36 T25N-R20E Sections 1-36 T26N-R20E Sections 18-36 T25N-R21E Sections 6, 7, 17, 18, 19, 30, and 31 T24N-R21E Section 7	Judith River Eagle-Virgelle	Enlarge the Leroy Field
1989-68 (11-30-1989)	Certain Fields within the State of Montana including Leroy	Not Applicable	Issuance of Drilling Permits at Locations Authorized by Field Rules
1993-57 (10-14-1993)	T23N-R19E SE¼SE¼ Section 20	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1994-44 (7-28-1994)	T23N-R19E SW¼SW¼ Section 21	Judith River Eagle-Virgelle	Exception Location to Board Order 1975-19
1998-76 (9-3-1998)	T25N-R20E SW¼SE¼ Section 6	Judith River Eagle-Virgelle	Exception Location to Board Orders 1975-19 and 1987-31
2000-18 (2-10-2000)	T25N-R20E SE¼SW¼ Section 6	Judith River Eagle-Virgelle	Exception Location to Board Orders 1975-19 and 1987-31
2000-61 (5-18-2000)	T25N-R20E SE¼SW¼ Section 6	Judith River Eagle-Virgelle	Exception Location to Board Orders 1975-19, 1987-31 and 2000-18

Table O.2-2
Sawtooth Mountain Field Board Orders

(Note – The below orders are not all-inclusive for the Sawtooth Mountain Field because only a small portion of the field is contained within the Monument.)

Board Order (Approval Date)	*Area Covered by Order*	*Geologic Formation Covered by Order*	*Spacing or Exception to State Spacing Regulations*
1976-45 (7-15-1976)	T26N-R20E Sections 1-8 T27N-R18E Sections 1-3, 10-16, 21, 22, 27, and 28 T27N-R19E Sections 3-18, 20 and 21 T27N-R19E Sections 5-9, 15-22, 26-36 T28N-R19E Sections 31-34	Judith River Eagle-Virgelle	Sawtooth Mountain Field Delineated at 640 acre spacing. 3 Exception Locations included; however, they are outside the Monument
2002-199 (12-5-2002)	T26N-R20E Section 2	Judith River Eagle-Virgelle	Increased well density and exception to Board Order 1976-45 allowing three additional wells in Section 2, but not closer than 660 feet to spacing unit boundary for a total of four wells. Order implies to keep 640 acre spacing.
2004-111 (4-1-2004)	T26N-R20E Section 1	Judith River Eagle-Virgelle	Increased well density and exception to Board Order 1976-45 allowing two additional wells in Section 1, but not closer than 660 feet to spacing unit boundary for a total of 3 wells. Order implies to keep 640 acre spacing.
2004-161 (5-20-2004)	T26N-R20E Section 3	Judith River Eagle-Virgelle	Increased well density and exception to Board Order 1976-45 allowing two additional wells in Section 3, but not closer than 660 feet to spacing unit boundary for a total of 3 wells. Order implies to keep 640 acre spacing.

Appendix O.3

Reasonable Foreseeable Development

Summary

The Reasonable Foreseeable Development (RFD) Scenario is a long-term projection (scenario) of oil and gas exploration, development, production, and reclamation activity in the Upper Missouri River Breaks National Monument. The Monument Study Area (area in review) lies in the East Block of the Monument and encloses the 43 Federal leases that exist on Monument lands. The RFD projects a baseline scenario of activity assuming all potentially productive areas can be open under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation or executive order. It provides basic information that is analyzed in the National Environmental Policy Act (NEPA) document under various alternatives. In this case, the NEPA document is the Upper Missouri River Breaks National Monument Resource Management Plan - Environment Impact Statement. The complete RFD is available for review at the BLM Great Falls Oil & Gas Field Station, Lewistown Field Office, Montana State Office, and on the BLM website at http://www.blm.gov/mt/st/en/fo/lewistown_field_office/um_rmp_process.html.

The RFD Study Area (study area) lies in northcentral Montana, approximately 60 miles north of Lewistown, Montana, and 38 miles south of Chinook, Montana. The area contains three producing gas fields with 41 active gas wells that are completed in the Judith River or Eagle Formations. Of the 41 active wells, 21 are producing and 20 are shut in. Ten of the active wells are in the Monument. In addition, the BLM currently has three approved Applications for Permit to Drill (APDs) (undrilled), two within the Monument and one within 1/2 mile of the Monument. The greater portion of the study area is characterized by steep river breaks country with plateaus and narrow ridges caused by erosion.

The Bureau of Land Management (BLM) has received APDs from three federal lease holders in the study area in Blaine County, Montana. One APD has been received from Klabzuba Oil and Gas, Inc., one from Macum Energy, Inc., and one from Devon Energy. All three are pending approval based on the outcome of the Monument RMP/EIS. The three wells would be drilled from the following locations:

- Klabzuba Federal 31-25-20B
  SE¼NW¼ of Section 31, T. 25 N., R. 20 E.
- Macum Federal 23-10
  NE¼SW¼ of Section 10, T. 25 N., R. 20 E.
- Devon Federal 9-7
  SW¼NE¼ of Section 9, T. 26 N., R. 20 E.

The wells (Figure O.3-1) would develop known gas resources in three producing gas fields in the study area. The wells would not require the construction of any new roads. If the wells are productive, they would require the installation of 3.7 miles of new pipeline in the study area to connect into existing pipelines. If the wells are productive, they would require the installation of 3.7 miles of new pipeline in the study area to connect into existing pipelines.

The infrastructure related to natural gas surface operations, other than the access roads and pipelines, includes the following:

- Meter shed (8 feet long x 8 feet tall x 5 feet wide)
- Well head (can be enclosed within the meter shed depending on the operation)
- Gas meter run (enclosed within the meter shed)
- Glycol barrel (can be enclosed within the meter shed)
- Small water separator (normally enclosed within the meter shed depending on the well and the operation)
- Water pit sized depending on the operation, but can range from 20 feet x 20 feet x 8 feet to 40 feet x 40 feet x 10 feet)
- Gas compressor (Compressors typically do not accompany each well. Depending on the operation and the size of the compressor, one gas compressor could service 8-12 wells). Currently, no gas compressors are located within the study area; however, a skid-mounted 42 HP compressor has been approved by the State of Montana on the David Kincaid No. 1 private well (the compressor has not been installed as of the date of this document).

The study area is being addressed because of the potential for future exploration and development on lands with existing federal leases. All federal lands in the study area are considered to have moderate and high potential for oil and gas occurrence. Occurrence is based on structural geology and historic activity of the area. It is further confirmed using well information to identify the extents of reservoirs. The areas considered to have high potential are those lands in the 18 exploration/development areas (also referred to as exploration/production areas) where commercial volumes and moderate shows of natural gas were evident

at the time of well completion (Figure O.3-2). All other federal lands in the study area are considered to have moderate potential for oil and gas occurrence.

In conjunction with these proposed actions, a review was conducted to evaluate the geologic potential of the study area and determine the Reasonable Foreseeable Development (RFD) that could be expected. A total of 11 exploration/production areas were identified with RFD well projections, as shown in Table O.3-1.

Specific well locations are not identified because many wells are considered proprietary information.

In addition to the 15.9 miles of existing roads supporting natural gas operations, the RFD locations would require 34.1 miles of new roads both in the Monument and within 1/2 mile of the Monument.

In addition to the 52.2 miles of existing pipeline, assuming a 35% success rate and because pipelines will be mostly buried in the access road corridor, the length of road to each new well was used. The new miles of pipelines are estimated at 11.9 miles. Liquid hydrocarbon storage at each well site is typically not required for the wells in the study area because the gas in this region normally does not yield liquid hydrocarbon. As a result, the number of well site visits can be limited to only those necessary for routine maintenance as determined via remote well monitoring with radio telemetry.

Figure O.3-1

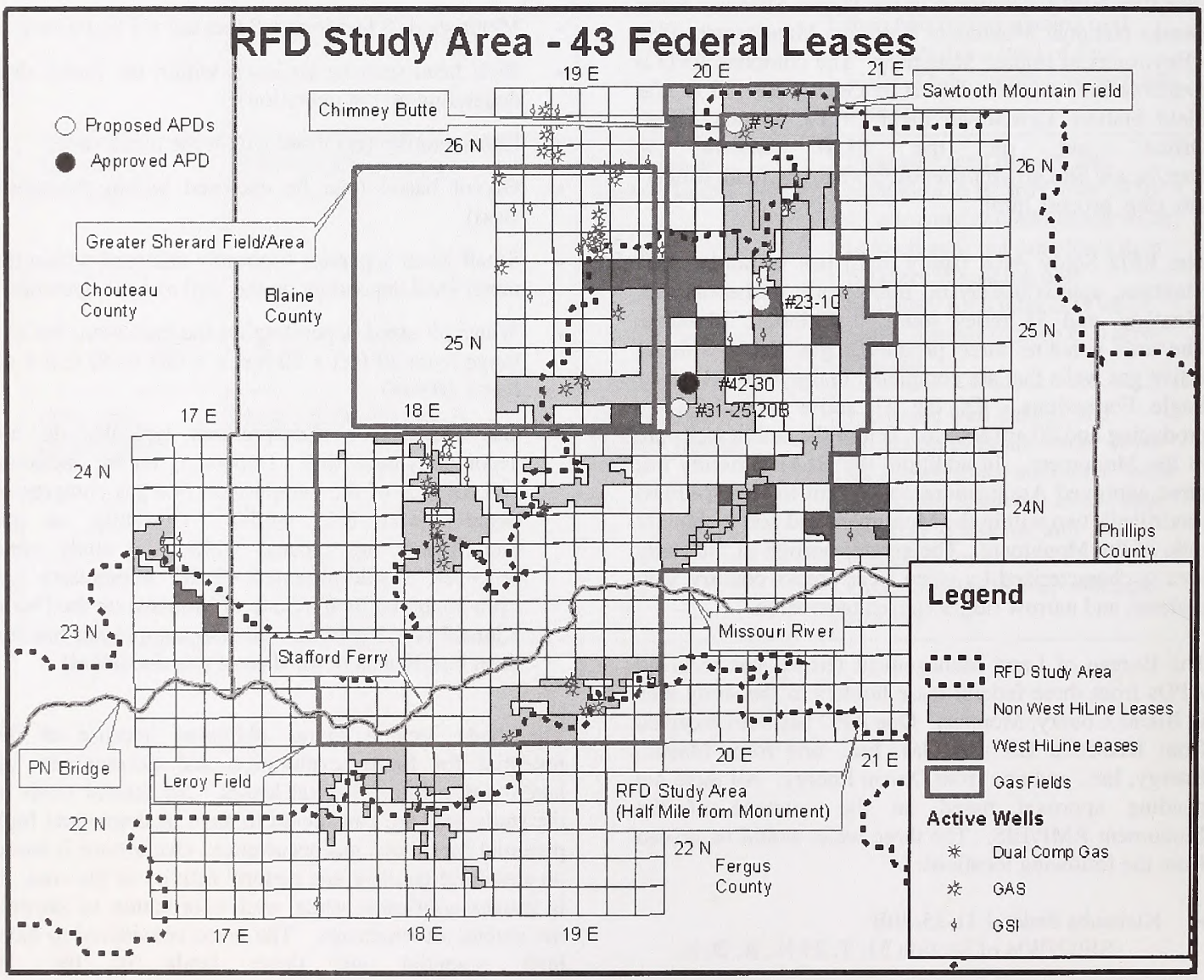
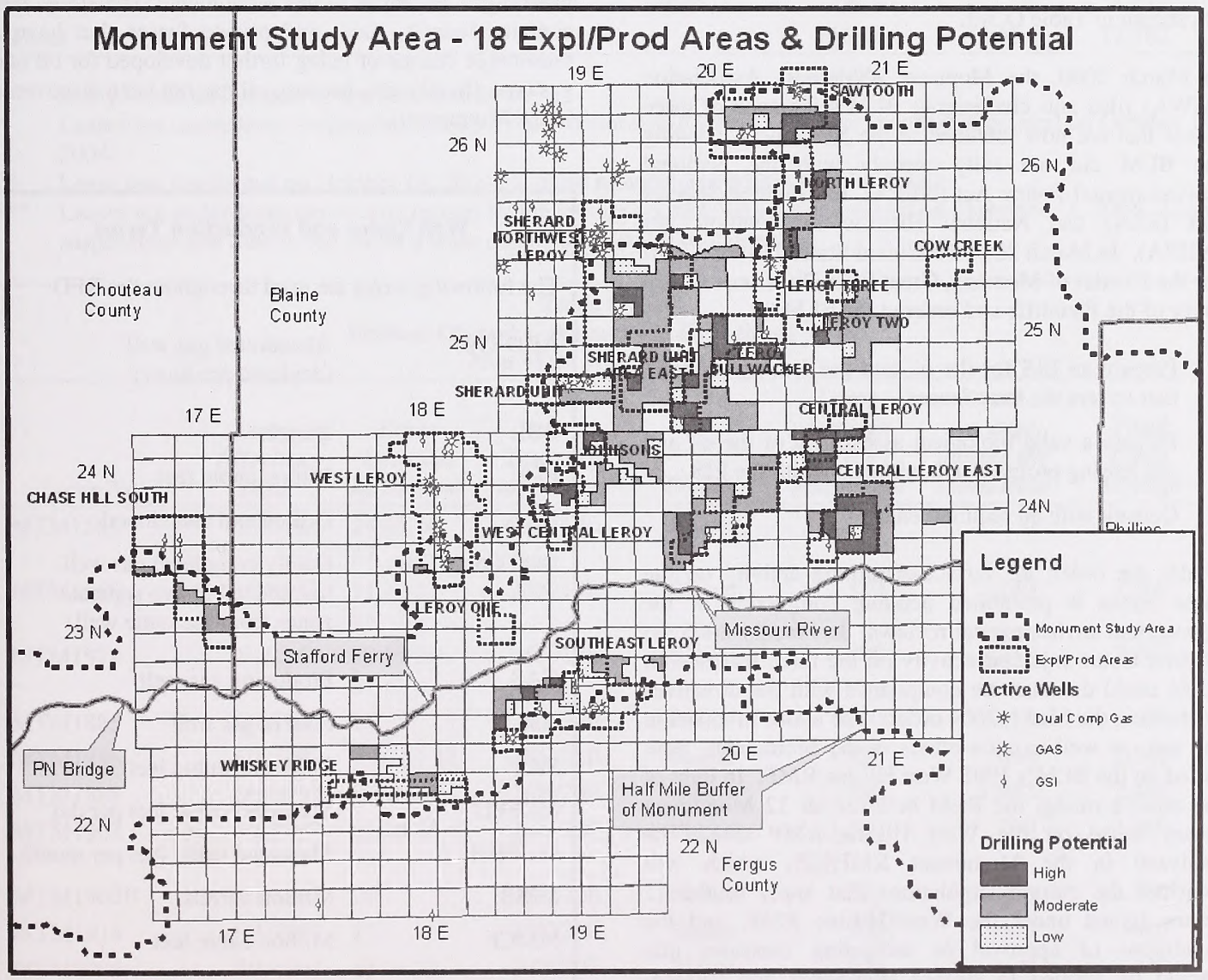


Table O.3-1
RFD Well Projections

Exploration/Production Area	*Wells within 1/2 Mile of the Monument*	*Monument Wells*	*Total Wells*
North Leroy	4	1	5
Central Leroy	0	6	6
Central Leroy East	0	3	3
Leroy Bullwacker East	0	6	6
Sherard Northwest Leroy	7	8	15
West Leroy	1	0	1
South Sawtooth	13	4	17
Sherard Unit Area East	2	8	10
Southeast Leroy	1	1	2
Chase Hill	0	2	2
Sherard Unit	1	5	6
Total Wells in the 11 Areas	29	44	73

Figure O.3-2



RFD Study Area

The study area (study area) for this RFD is defined as the lands within the 43 federal oil and gas leases in the Monument and the lands which lie ½ mile outside of the Monument. This area is further described as being located approximately 60 miles north of Lewistown, Montana. The study area lies among three producing fields known as the Leroy, Sherard and Sawtooth Mountain Gas Fields. Geologically speaking, the study area lies at the southeastern extent of the Bearpaw Uplift in northcentral Montana. The study area can be geographically described as an area starting from a point four miles northeast/east of the PN Bridge and extending 31 miles to the northeast by 15 miles wide through the Bullwhacker area and continuing on up to the Chimney Butte/Al's Creek Drainage area (Figure O.3-1).

The study area includes 43 federal oil and gas leases issued between 1967 and 1999 and covers about 42,000 acres. Of the 43 leases, 12 were issued based on the 1988 West HiLine RMP (Table O.3-2). The remaining 31 leases are considered "non-West HiLine leases" and are shown in Table O.3-3.

In March 2000, the Montana Wilderness Association (MWA) filed suit challenging BLM's issuance of three leases that are now included in the Monument, alleging the BLM did not fully comply with the National Environmental Policy Act (NEPA), Endangered Species Act (ESA) and National Historic Preservation Act (NHPA). In March 2004 the United States District Court for the District of Montana, Great Falls Division, ruled in favor of the Plaintiffs and ordered the BLM to:

- Prepare an EIS for the oil and gas leasing program that covers the three leases.
- Prepare a valid biological assessment of the oil and gas leasing program in conjunction with the EIS.
- Consult with all required entities.

Under the order, all surface-disturbing activity on the three leases is prohibited pending completion of the appropriate environmental reviews. In January 2006 the District Court enjoined activity on the three leases until BLM could demonstrate compliance with the directives set forth in the March 2004 order. The leases involved in the suit, as well as nine others in the Monument, were based on the BLM's 1988 West HiLine RMP. In light of the court's ruling, the BLM believes all 12 Monument leases based on the West HiLine RMP should be analyzed in the Monument RMP/EIS, which will consider the current stipulations that apply to the 12 leases issued under the West HiLine RMP, and the conditions of approval or mitigating measures that should be applied to surface occupancy and surface-disturbing activities associated with all 43 oil and gas leases in the Monument. To fully comply with the January 2006 court order the Monument RMP/EIS also addresses a no lease alternative for the 12 West HiLine leases. The no lease alternative is addressed as a subalternative, Alternative E_{NL} which would not allow surface disturbance or the processing of applications for permits to drill (APDs). The BLM will not process any further APDs on leases in the Monument until the Monument RMP/EIS is completed.

Past, Present and Future Oil and Gas Exploration and Development Activity in the Monument

Until the 1960s and 1970s drilling and exploration activity was relatively low within the study area. Although gas was known to exist, it was not a primary objective or target while industry was in search of oil, due to gas prices as low as 10¢/MCF and lack of pipeline infrastructure. With gas prices now ranging between $5 and $7/MCF and more infrastructure available, the economic incentive exists to further explore and develop natural gas resources in the Monument. The study area contains federal, state, and private leases that have a reasonable chance of being further developed for oil and gas (specifically gas, because oil has not been discovered in the Monument).

Well Status and Production Terms

The following terms are used throughout the RFD:

ABD-GW	Abandoned gas well (depleted producer)
BBL	Barrels
BCF	Billion cubic feet
D&A	Drilled and abandoned
Dual Comp Gas	Dually completed gas well (completed in two separate zones from the same well)
GAS	Producing gas well
GSI	Shut in gas well
MCF	Thousand cubic feet
MCFPD	Thousand cubic feet per day
MCFPM	Thousand cubic feet per month
MMB	Million barrels
MMCF	Million cubic feet

Table O.3-2 Federal Oil and Gas Leases in RFD Study Area West HiLine Leases							
Lease No.	*Lease Effective Date*	*Lease Location by Section*[1]	*Township and Range*	*County*	*Lease Acreage in the Monument*	*Lease Acreage outside the Monument*	*Total Lease Acreage*
MTM84559*	11/1/1995	5 6 7	25N/20E	Blaine	1,880	0	1,880
MTM84560*	11/1/1995	6 7 31	26N/20E	Blaine	134	1,119	1,253
MTM87212*	9/1/1997	3	25N/19E	Blaine	122	528	650
MTM87658*	2/1/1998	25	24N/20E	Blaine	485	0	485
MTM89082*	5/1/1999	1 2	25N/19E	Blaine	1,131	167	1,298
MTM89452**	11/1/1999	5 9	23N/17E	Chouteau	800	0	800
MTM89469*	11/1/1999	35	25N/19E	Blaine	640	0	640
MTM89473***	11/1/1999	15 21 22	24N/20E	Blaine	1,240	0	1,240
MTM89474***	11/1/1999	10	25N/20E	Blaine	80	480	560
MTM89475*	12/1/1999	13 17	25N/20E	Blaine	1,280	0	1,280
MTM89476*	12/1/1999	21 22	25N/20E	Blaine	1,120	160	1,280
MTM89482***	11/1/1999	19 20 29	24N/21E	Blaine	1,416	0	1,416
Total					**10,328**	**2,454**	**12,782**

[1] Many leases do not take up the full section.

* Leases are under lease suspension caused by the Monument RMP/EIS – Lease suspension granted on October 14, 2004.

** Lease was segregated on October 14, 2004 for those minerals not within the Monument.

*** Leases are under lease suspension caused by the lawsuit – Lease suspension granted on September 1, 2000. Lease suspensions add time to the life of a lease due to administrative actions.

Table O.3-3 Federal Oil and Gas Leases in RFD Study Area Non-West HiLine Leases							
Lease No.	*Lease Effective Date*	*Lease Location by Section*[1]	*Township and Range*	*County*	*Lease Acreage in the Monument*	*Lease Acreage outside the Monument*	*Total Lease Acreage*
MTM1565	5/1/1967	24 25 26 27	25N/19E	Blaine	2,560	0	2,560
MTM1568	5/1/1967	11 12 13 14	25N/19E	Blaine	2,320	240	2,560
MTM1578	5/1/1967	28 29 30 31 32	25N/19E	Blaine	575	1,988	2,563
MTM1885	6/1/1967	1 2	26N/20E	Blaine	40	611	651
MTM1886	6/1/1967	9 10 11 12	26N/20E	Blaine	1,920	640	2,560
MTM1888	6/1/1967	2 3 4 6	26N/20E	Blaine	480	1,982	2,462
MTM1903	6/1/1967	23 24 25 35	26N/20E	Blaine	1,360	200	1,560
MTM1903B	6/1/1967	26	26N/20E	Blaine	320	240	560
MTM1914	6/1/1967	15	25N/20E	Blaine	200	440	640
MTM2060	7/1/1967	15 21 22 28 29 32	24N/20E	Blaine	640	0	640

Table O.3-3
Federal Oil and Gas Leases in RFD Study Area
Non-West HiLine Leases

Lease No.	*Lease Effective Date*	*Lease Location by Section*[1]	*Township and Range*	*County*	*Lease Acreage in the Monument*	*Lease Acreage outside the Monument*	*Total Lease Acreage*
MTM2061	7/1//1967	21 28 29 31 32	24N/20E	Blaine	640	0	640
MTM13816	11/1/1969	7 11 12 13 14 15	24N/21E 24N/20E	Blaine	2,533	0	2,533
MTM13818	11/1/1969	20 21 28 29 30 31	24N/20E	Blaine	2,532	0	2,532
MTM13821A	11/1/1969	29 30 31 32	24N/21E	Blaine	1,099	0	1,099
MTM13827	11/1/1969	11 27 29 30	24N/21E	Blaine	1,156	0	1,156
MTM16098	9/1/1970	14 15 17 19 20 21 22	24N/19E	Blaine	1,240	1,280	2,520
MTM16102	9/1/1970	3 20 30	25N/20E	Blaine	1,506	163	1,669
MTM16103	9/1/1970	22 27 28 33 34	26N/20E	Blaine	13	2,507	2,520
MTM16327	10/1/1970	9 10 11 14 15 22 23 27 34	24N/18E	Chouteau	80	2,358	2,438
MTM16458	10/1/1970	21 23 24 25 27 33	26N/20E	Blaine	688	1,272	1,960
MTM16461	10/1/1970	29 31 32 33	25N/20E	Blaine	2,547	0	2,547
MTM16617	11/1/1970	7 8 10 17 18 19 22 25	22N/18E	Fergus	490	929	1,419
MTM16618	11/1/1970	23 24 25 26 35 36	24N/18E	Chouteau	320	2240	2,560
MTM16939	12/1/1970	7 17 18 19	25N/21E	Blaine	2,530	0	2,530
MTM17376	2/1/1971	7 33 35	24N/18E	Chouteau	40	80	120
MTM18274	7/1/1971	4 5 9 10 13 14 15 17 22 23 24	22N/18E	Fergus	1,367	1,160	2,527
MTM18282	5/1/1973	29 30 31 32 33	23N/19E	Blaine	851	1,680	2,531
MTM18283	5/1/1973	22 23 24 26 27 28 29	23N/19E	Blaine	1,240	1,320	2,560
MTM19446	9/1/1971	30 31	24N/17E	Chouteau	110	1,113	1,223
MTM53751	6/1/1982	20 21 22 23 24	23N/19E	Blaine	680	160	840
MTM89460	11/1/1999	7 11	22N/18E	Fergus	400	40	440
Total					**32,477**	**22,463**	**55,120**

[1] Many leases do not take up the full section.

Historical Geophysical and Chemical Surveys

Natural gas was discovered in the study area through direct and indirect exploration methods. Exploration within the region surrounding the Monument began in the early 1920s near Winifred, Montana. The industry utilized direct methods to explore for gas by conducting geologic surveys of rock outcrops, gas seeps, drilling wells to test their theories and data achieved from newly drilled wells (even though there were very few at that time) to further understand the subsurface geology and then creating early renditions of geologic maps of the area. Between 1920 and the early 1970s, natural gas was not the primary product that industry sought. Oil was the primary target. Exploration in this area remained at relatively low levels, until a sizeable discovery was made in 1971 just to the north of the study area. The discovery sparked more interest in the area to a point to where the maximum number of wells drilled in the area now included in the Monument peaked in 1974 at 26 wells. This and continued drilling efforts eventually led to the discovery of more commercial natural gas deposits and further infrastructure was built in and around the Monument (see New Field and Reservoir Discoveries). Not until the late 1970s and early 1980s had seismic technology been used to gain a more thorough understanding of the area's subsurface geologic structure. Further improvements in seismic technology, such as 3-D seismic surveys and data processing techniques continued to enhance the understanding of the area's subsurface geology.

Even though seismic data is limited throughout the Monument, 2-D surveys of the fringe areas of the Monument have been made. Seismic surveys were conducted in the late 1980s in the Sherard Area and it is estimated that 25 miles of seismic line were shot over what is now Monument land in that area. More recently, in 2002 and 2003, additional 2-D type surveys were shot in the north part of the Monument (South Sawtooth Field). It is estimated that six miles of seismic line were shot over Monument land in that area. This combined with recent well activity is being used to gain a better understanding of the area's complicated subsurface. Further improvements in seismic technology such as 3-D seismic surveys and data processing techniques continue to enhance the understanding of the area's subsurface geology. No 3-D surveys have been shot in the Monument, however it is understood there is interest in conducting a 3-D survey on some of the lands in the Sherard area of the Monument in the near future. This could further define the extent of prospects that operators may want to develop.

Exploratory/Development Drilling

The following discussion regards historic drilling activities adjacent to and within the study area. The narrative also discusses potential that specific areas contain for future drilling and the potential for oil and gas to occur. The areas identified under this narrative are based on well information (drilling and electric logs), reservoir data, industry's geologic interpretation, historical production data and information provided by industry indicating plans to explore and develop natural gas in the Monument and adjacent areas. The identified areas exclude the potential for oil and gas to be discovered on state and private lands intermingled with or adjacent to the Monument. Should industry desire to explore for oil and gas on state or private lands, the environmental document to address that activity would be outside of this document and left to the private and state landowner/manager's discretion.

The majority of the oil and gas exploration and development activities in the region surrounding and inside the study area (namely 35 townships covered by T21-27N, R17-21E) occurred prior to the Monument. Exploration for oil and gas in the region began in 1917 (the date the first well was drilled). A total of 869 wells have been drilled within these 35 townships prior to the Monument.

The first well in the study area was drilled in 1939. Since then, 138 wells have been drilled in the Monument with an additional 86 wells (224 wells total) drilled within 1/2 mile of the Monument. Some activity falls outside of the study area because of a federal lease, federal Communitization Agreement (CA), or federal unit. The majority of the historic drilling in the study area occurred in the 1970s and 1980s following trends with respect to natural gas pricing and infrastructure (Figure O.3-3). Table O.3-4 describes the currently active wells with an APD in the Monument or within 1/2 mile of the Monument.

A total of 17 wells have tested/produced commercial quantities of gas for a success rate of 12.2% in the Monument. The overall success rate increases to 18% when wells within the study area are added, or 40 out of 224 wells. The success rates have improved in more recent years as knowledge of the area improves including additional seismic information, reprocessed seismic data and well information. Using the previous 20 years of drilling history, the overall success rate improves from 18% to 35%.

Although it is difficult to predict the size and the frequency of future discoveries with certainty, it can be estimated based on historical records that the average discovery will yield 390,000 MCF (0.39 BCF). This information is based on an average of ultimate recovery figures generated by production decline curve analysis of the 40 wells within the study area.

New Field and Reservoir Discoveries

Outside of the Judith River, Eagle and Carlile Formations within the study area there is limited chance for new fields and reservoir discoveries based on historical drilling patterns. It is not known if operators of the federal leases will perform exploratory drilling into deeper horizons prior to the expiration of the leases. Once a lease expires, no further oil or gas activity will occur on the lease. Other than the mentioned formations, no other discoveries have been made in other formations in the vicinity of the study area.

Exploration of the region began in the early 1920's in the Sherard and Winifred areas. The first study-area well was drilled in the Whiskey Ridge area. The area is considered the southernmost exploration area common to the Monument and lies approximately three miles south and west of the McClelland/Stafford Ferry. The Mauland No. 2 well was the Monument area's first exploration well. It was drilled in October 1939 by E & M Oil and Gas Company at a location in the SE 1/4 SE 1/4 of Section 4, T. 22 N., R. 18 E., Fergus County. The well was drilled to a total depth (TD) of 635 feet and reached the Eagle Sandstone at 424 feet. The well was drilled as a dry hole and was subsequently plugged and abandoned.

The discovery well for the Leroy Gas Field (the first commercially productive well within the Monument) was drilled about a mile north of the Missouri River and approximately three miles downstream of the McClelland/ Stafford Ferry (see Section 4.2.7, Leroy One Exploration/Production Area). The Bearpaw Federal No. 1-18 well was spud in October 1968 by El Santo Petroleum Corp. & Royal Crest Oil Corp. at a location in the NW¼NW¼NW¼ of Section 18, T. 23 N., R. 19 E., Blaine County. The well was completed in November 1968 as a producing gas well and later produced 476,996 MCF of natural gas between December 1980 and May 1991 before it was plugged and abandoned on June 1, 1996 as a depleted producer. Note that the well was idle (shut-in) for nearly twelve years before pipeline infrastructure was introduced to the area in 1980. Although this well was considered the first commercially productive well within the Monument, two other successful wells were drilled in the Monument prior to the above-referenced well but were never produced.

Figure O.3-3

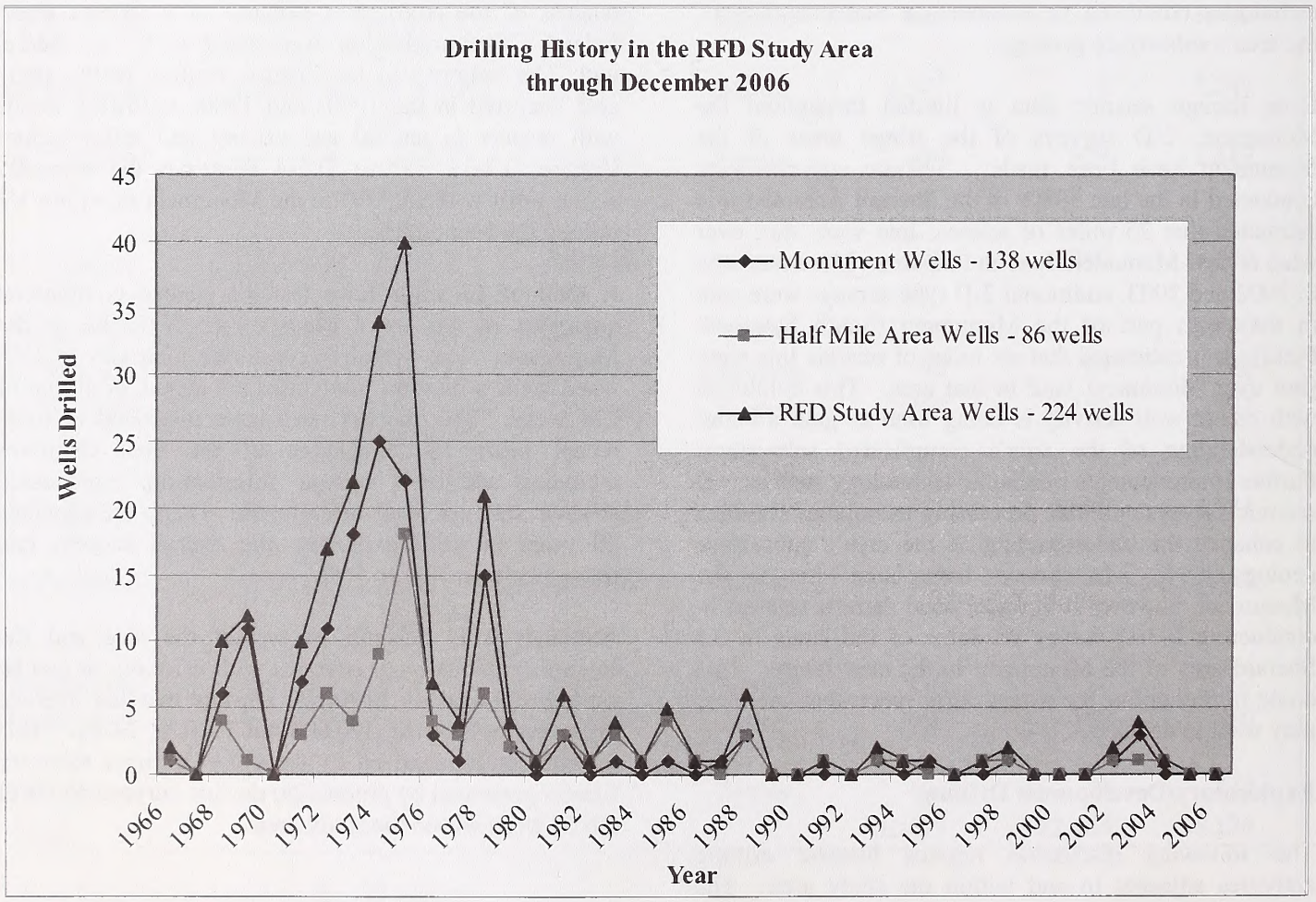


Table O.3-4
Active Wells or Wells with a Permit to Drill in the Monument, On any Part of a Lease where the Lease is Contained within the Monument or the Well(s) are within 1/2 Mile of the Monument (as of 2/21/2007)

Mineral Ownership	Lease, CA or Unit	Operator	Well Name	API Well No	Well Type	Well Status	Field Name	Well Within Monument Area? (see footnotes below)	Location (T-R)	Sec	Spot	County	Exploration/Production Area	E/P Area No.	Total Depth
FEDERAL	MTM16102/MTM93244	Macum Energy Inc.	Macum Federal 31-3	25-005-22897-00-00	Gas	Producing	Leroy	Yes	25N-20E	3	NW NE	Blaine	North Leroy	2	1802
FEDERAL	MTM13816	Macum Energy Inc.	Federal 1-12	25-005-21542-00-00	Gas	Shut In	Leroy	Yes	24N-20E	12	NE SW	Blaine	Central Leroy	3	1847
FEDERAL	MTM2060/CA-NRM1213	Macum Energy Inc.	Federal 29-15	25-005-21712-00-00	Gas	Shut In	Leroy	Yes	24N-20E	29	NW SW SE	Blaine	Central Leroy	3	1680
FEDERAL	MTM2060	Macum Energy Inc.	Macum Federal 22-28	25-005-22895-00-00	Gas	Shut In - WOPL	Leroy	Yes	24N-20E	28	SE NW	Blaine	Central Leroy	3	1836
FEDERAL	MTM13821-A/CA-NRM1764	Macum Energy Inc.	Federal 30-1	25-005-21333-00-00	Gas	Shut In - WOPL	Wildcat Blaine	Yes	24N-21E	30	NE SW SE	Blaine	Central Leroy East	4	1400
FEDERAL	MTM16102	Macum Energy Inc.	Macum Federal 42-30	25-005-22899-00-00	Gas	Permit to Drill	Leroy	Yes	25N-20E	30	SE NE	Blaine	Leroy/Bullwacker - APD	5	
FEDERAL	MTM84559	Klabzuba Oil & Gas, Inc.	Federal 6-25-20B	25-005-22921-00-00	Gas	Permit to Drill	Leroy	Yes	25N-20E	6	SE SW	Blaine	Sherard/Northwest Leroy	8	
FEDERAL	MTM16618/CA-NRM944	Klabzuba Oil & Gas, Inc.	35-24-18A	25-005-21724-00-00	Gas	Producing	Leroy	Yes	24N-18E	35	SE NE SW	Blaine	West Leroy	10	1505
FEDERAL	MTM16939	Macum Energy Inc.	Federal 1-7	25-005-21565-00-00	Gas	Shut In	Leroy	Yes	25N-21E	7	SE NW NW	Blaine	Leroy Three	15	1694
FEDERAL	MTM1578/UA-Sherard PA E	Devon Energy Corp.	U.S. 6-28	25-005-21718-00-00	Gas	Producing	Sherard, Area	Yes	25N-19E	28	SE NW	Blaine	Sherard Unit	17	1595
FEDERAL	MTM1565/Sherard PA E	Devon Energy Corp.	U.S. 4-27	25-005-21872-00-00	Gas	Shut In	Sherard, Area	Yes	25N-19E	27	SE NW NW	Blaine	Sherard Unit	17	1621
FEDERAL	MTM1578/UA-Sherard PA E	Devon Energy Corp.	U.S. 28-1	25-005-23044-00-00	Gas	Producing	Sherard, Area	Yes	25N-19E	28	NE NE	Blaine	Sherard Unit	17	1800
STATE	N/A	Macum Energy Inc.	State 1	25-005-21652-00-00	Gas	Shut In	Leroy	No 6	25N-20E	16	NE SW SW	Blaine	Leroy/Bullwacker	5	1795
FEDERAL	MTM16618	Klabzuba Oil & Gas, Inc.	26-24-18	25-005-21692-00-00	Gas	Producing	Leroy	No 5	24N-18E	26	SE NW SW	Blaine	West Leroy	10	1649
FEDERAL	MTM1888/CA-NRM972	Devon Energy Corp.	U.S. 2-3	25-005-23245-00-00	Gas	Producing	Sawtooth Mountain	No 5	26N-20E	2	NE NW	Blaine	Sawtooth	11	1480
FEDERAL	CA - NRM997	Klabzuba Oil & Gas, Inc.	26-24-18B	25-005-21730-00-00	Gas	Producing	Leroy	No 4	24N-18E	26	NE SW NW	Blaine	West Leroy	10	1612
PRIVATE	CA - NRM996	Klabzuba Oil & Gas, Inc.	23-24	25-005-21748-00-00	Gas	Shut In	Leroy	No 4	24N-18E	23	NE SW SW	Blaine	West Leroy	10	1702
PRIVATE	CA - NRM1167	Klabzuba Oil & Gas, Inc.	22-24	25-005-21849-00-00	Gas	Producing	Leroy	No 4	24N-18E	22	SW NE NE	Blaine	West Leroy	10	1644
PRIVATE	CA - NRM1240	Klabzuba Oil & Gas, Inc.	Bleha 10-24-18	25-005-22366-00-00	Gas	Shut In	Leroy	No 4	24N-18E	10	S2 W2 NE	Blaine	West Leroy	10	1840
FEDERAL	MTM16327/ CA - NRM995	Klabzuba Oil & Gas, Inc.	P-15-24-18N	25-005-22404-00-00	Gas	Producing	Leroy	No 4	24N-18E	15	W2 SE SE	Blaine	West Leroy	10	1579
PRIVATE	CA - MTM69515	Klabzuba Oil & Gas, Inc.	D-23-24-18-N	25-005-22405-00-00	Gas	Shut In	Leroy	No 4	24N-18E	23	NW NW	Blaine	West Leroy	10	1641
PRIVATE	CA - NRM1176	Klabzuba Oil & Gas, Inc.	BROWN 30-24-17	25-015-21371-00-00	Gas	Shut In - WOPL	Sherard, Area	No 4	24N-17E	30	NE SW SE	Chouteau	Chase Hill South	14	1435
FEDERAL	MTM16618	Klabzuba Oil & Gas, Inc.	35-24-18	25-005-21739-00-00	Gas	Producing	Leroy	No 3/5	24N-18E	35	W2 NE NW	Blaine	West Leroy	10	1530
FEDERAL	MTM1886	Devon Louisiana Corporation	U.S. 9-9	25-005-23309-00-00	Gas	Producing	Wildcat	No 3/5	26N-20E	9	NE SE	Blaine	Sawtooth	11	1800
FEDERAL	MTM18282	Klabzuba Oil & Gas, Inc.	31-23-19	25-027-21102-00-00	Gas	Producing	Leroy	No 3/5	23N-19E	31	NE SW SE	Fergus	Southeast Leroy	13	1830
FEDERAL	MTM18283	Klabzuba Oil & Gas, Inc.	N 27-23-19-B	25-027-21197-00-00	Gas	Producing	Leroy	No 3/5	23N-19E	27	NE SE SW	Fergus	Southeast Leroy	13	1850
FEDERAL	MTM18283	Klabzuba Oil & Gas, Inc.	Federal A-28-23-19-N	25-027-21206-00-00	Gas	Producing	Leroy	No 3/5	23N-19E	28	NW NE NE	Fergus	Southeast Leroy	13	1900
FEDERAL	MTM53751/CA-MTM69544	Klabzuba Oil & Gas, Inc.	P21-23-19N	25-027-21208-00-00	Gas	Producing	Leroy	No 3/5	23N-19E	21	SE SE	Fergus	Southeast Leroy	13	1722
FEDERAL	MTM1578	Devon Energy Corp.	U.S. 29-10	25-005-22633-00-00	Gas	Shut In	Sherard, Area	No 3/5	25N-19E	29	NW SE	Blaine	Sherard Unit	17	1600
FEDERAL	MTM16103/CA-NRM1191	Macum Energy Inc.	Federal 34-1	25-005-21369-00-00	Gas	Shut In	Leroy	No 3/4	26N-20E	34	N2 NW SE	Blaine	North Leroy	2	922
FEDERAL	MTM16458/CA-NRM768	Klabzuba Oil & Gas, Inc.	FED 23-26-20	25-005-21656-00-00	Gas	Shut In	Leroy	No 3/4	26N-20E	23	SW NW NE	Blaine	North Leroy	2	1775
FEDERAL	MTM18283/CA-NRM1512	Klabzuba Oil & Gas, Inc.	FEDERAL 27-23-19	25-027-21115-00-00	Gas	Producing	Leroy	No 3/4	23N-19E	27	SE SE	Fergus	Southeast Leroy	13	1837
PRIVATE $#	Sherard PA A	Devon Energy Corp.	34-15	25-005-22574-00-00	Gas	Producing	Sherard Area	No 3	26N-19E	34	SWSE	Blaine	Sherard/Northwest Leroy	8	1800
STATE $#	N/A	Klabzuba Oil & Gas, Inc.	State 36-26-19	25-005-22784-00-00	Gas	Producing	Wildcat Blaine	No 3	26N-19E	36	NE SE	Blaine	Sherard/Northwest Leroy	8	1900
PRIVATE $#	N/A	Macum Energy Inc.	Osburnsen 2	25-027-21046-00-00	Gas	Shut In	Leroy	No 3	23N-19E	25	SE NW NW	Fergus	Southeast Leroy	13	1980
FEDERAL	MTM89474	Macum Energy Inc.	Macum Federal 23-10	25-005-22898-00-00	Gas	Permit to Drill	Leroy	No 2/3/5	25N-20E	10	NE SW	Blaine	North Leroy -APD	2	
FEDERAL	MTM1914	Macum Energy Inc.	Federal 15-1	25-005-21109-00-00	Gas	Shut In	Leroy	No 2/3/5	25N-20E	15	W2 NE SW	Blaine	Leroy/Bullwacker	5	1987
FEDERAL	MTM1568	Klabzuba Oil & Gas, Inc.	11-25-19 FED	25-005-22453-00-00	Gas	Producing	Sherard, Area	No 2/3/5	25N-19E	11	NE SW SW	Blaine	Sherard/Northwest Leroy	8	1803
FEDERAL	MTM19446/CA-NRM1185	Klabzuba Oil & Gas, Inc.	USA 31-24-17-1	25-015-21352-00-00	Gas	Shut In - WOPL	Sherard, Area	No 1/3/5	24N-17E	31	SW NW NE	Chouteau	Chase Hill South	14	1580
PRIVATE	CA-NRM1739	Macum Energy Inc.	Manuel 1	25-027-21043-00-00	Gas	Shut In - WOPL	Wildcat Fergus	No 1/3	22N-18E	10	SE NE SW	Fergus	Whiskey Ridge	1	1879
PRIVATE	NRM1560	Macum Energy Inc.	D. Kincaid 1	25-005-21456-00-00	Gas	Shut In	Leroy	No 1/3	25N-20E	3	W2 SW	Blaine	North Leroy	2	1893
FEDERAL	MTM1903-B/CA-NRM1196	Devon Energy Corp.	FEDERAL 21X-26	25-005-21467-00-00	Gas	Producing	Sawtooth Mountain	No 1/3	26N-20E	26	SW NE NW	Blaine	North Leroy	2	1948
FEDERAL	MTM1888/CA-NRM972	Devon Energy Corp.	FEDERAL 1-2	25-005-21238-00-00	Gas	Shut In	Sawtooth Mountain	No 1/3	26N-20E	2	W2 SW NE	Blaine	Sawtooth	11	1339
PRIVATE	NCR269	Klabzuba Oil & Gas, Inc.	Bleha P 20-24-19-N	25-005-22185-00-00	Gas	Producing	Leroy	No 1/3	24N-19E	20	NE SE SE	Blaine	West Central Leroy	16	1805

1 - Well lies within a CA that is both in and outside the Monument.
2 - Well lies within a narrow finger protruding in the Monument.
3 - Well lies within a half mile of the Monument.
4 - Well lies within a CA that includes a Federal lease that also lies within the Monument.
5 - Well lies within a Federal lease that is both in and outside the Monument.
6 - Well lies within a State land section intermingled with the Monument.

$# - No Bearing on Federal Mineral Interest

Past and Present Oil and Gas Development Activity and Comparisons to Development Activity Located Outside the Monument

Leasing Activity, Unit Descriptions, Spacing Requirements, and Well Location by Class and Type

The study area currently includes 43 federal oil and gas leases (42,805 acres) and 3 state oil and gas leases (1,918 acres). The majority of the federal leases lie partially outside the Monument and can occur in a non-contiguous manner. Private land (surface and mineral ownership) in the area may also include oil and gas leases. The majority of the leased federal lands are in Blaine County (92% north of the river) and the remainder lie in Fergus and Chouteau Counties (5% and 3% respectively). None of the existing federal leases in the Monument are in Phillips County.

A summary of historical natural gas exploration and development in the Monument is shown in Table O.3-5.

A lease in the Monument may also be part of a Communitization Agreement (CA) and/or Unit Agreement. The agreements provide for an administrative method to develop the gas resources and allow a fair and equitable allocation of well production back to specific leases tied to the agreements, based on acreage within the agreements. The CAs are necessary to protect the various mineral interests (federal, state and private) involved in spacing units where normally only one well is allowed. Currently, 11 CAs are both in and outside the Monument. Another 10 CAs lie outside of the Monument, yet are common to the Monument because a portion of the lease is common to both the CA and the Monument. The CAs are formed based on standard state spacing requirements for gas wells (one well per 640 acres, statewide well spacing) and state-approved Board of Oil and Gas Conservation orders allowing reduced spacing, or one well per 320 acres to sufficiently develop the gas resource (State Board Order Nos. 19-75 and 31-87).

In addition to leases contained in the mentioned CAs, two federal leases are also located in a Unit within the Monument known as the Sherard Eagle Participating Area (PA) "E." PA "E" of the Sherard Unit was formed after the discovery of a geologic feature in Sections 27 and 28 of T. 25 N., R. 19 E., Blaine County, by drilling the U.S. No. 6-28 well in late 1974. The 1280-acre PA currently contains three active wells located in the Monument producing from the Eagle Formation.

Outside of the leased federal lands in the Monument, the chance of further oil and gas discovery is remote. Since the Proclamation withdrew all federal land in the Monument (unleased federal minerals totaling 348,824 acres), and no commercially productive oil or gas discoveries have been made within the confines of Monument lands west of McClelland/Stafford Ferry (federal, state or private), or east of the confluence of Bullwhacker Creek and the Missouri River, future exploration outside of the referenced geographic area is unlikely. Although there is no chance of further oil and gas discovery on unleased federal lands in the described area, there is potential for future exploration and development on the state and private minerals within the described lands and other state and private lands intermingled with the Monument.

Leroy Gas Field

The majority of the existing federal Monument leases lie within the Leroy Gas Field. The field was discovered in November 1968 by the Federal 1-18 well drilled by El Santo Petroleum Corp in the NW¼NW¼ NW¼ of Section 18, T. 23 N., R. 19 E.

Following the well which led to the discovery of the Leroy Gas Field in 1968, 40 additional wells were drilled on lands now in the Monument. Twenty-nine were abandoned as dry holes. Twelve were completed (11 to production and one shut-in without a pipeline). Of these twelve, six were eventually plugged (including the discovery well); leaving six active Leroy Gas Field wells in the Monument. Per State Board Order Nos. 19-75 and 31-87, the Leroy Gas Field is allowed to be developed on 320-acre spacing units for the Judith River and Eagle/Virgelle Formations with each unit consisting of half sections lying in a north-south or east-west direction. Two active wells currently produce natural gas. Combined production from the two wells through December 2006 is 0.85 BCF. Another four wells remain shut-in awaiting the outcome of the Monument RMP/EIS. Combined production from the four wells through December 2006 is 0.23 BCF.

Sixteen peripheral wells within 1/2 mile of the Monument produce from the Leroy Gas Field. They have produced 2.5 BCF through December 2006.

Another 11 wells, outside the Monument yet within the Leroy Gas Field and associated with Communitization Agreements, have produced 5.1 BCF. Of these 11 wells, four have been plugged.

Sawtooth Mountain Gas Field

The Sawtooth Mountain Gas Field lies at the very north edge of the Monument's east section. It is common to the Monument because two federal leases overlap the Monument and the Sawtooth Mountain Gas Field. Currently, no active Monument wells are within the Sawtooth Mountain Gas field leases; however, two wells lie adjacent to the Monument (less than 1/2 mile away) and are contained in a lease and CA both in and outside the Monument. The wells were drilled in the mid-1970s

and continue to produce. Geologic characteristics of the Sawtooth Mountain Gas Field are similar in nature to those of the Leroy Gas Field as they are adjacent to one another near the northern edge of the Monument.

Currently no federal wells are active in the Monument in the Sawtooth field. Two active wells currently produce natural gas within 1/2 mile of the Monument. Combined production from the two wells through December 2006 was 1.4 BCF.

Sherard Unit Area

Six of the leases in the Monument fall within the Sherard Unit Area. The first successful well in this area was drilled in December 1974 and continues to produce. Geologic characteristics of the Sherard Unit Area in the Monument are similar in nature to those of the Leroy Gas Field as a relatively short distance separates the two fields.

The Sherard Unit Area allows for one well per section with numerous well density and location exceptions. Because the area is so broken with fault blocks, there is a need to drill additional wells. For example, if one section of land contains ten individual fault blocks, it is highly likely that the BLM and the Montana Board of Oil and Gas Conservation would be petitioned by industry to allow wells to be drilled into each discrete fault block in order to produce the natural gas resource from each fault block.

Three federal wells are currently active in the Sherard Unit Area of the Monument. Two of the wells continue to produce and the other well is to be plugged and abandoned. Combined production from the three wells through December 2006 was 4.0 BCF.

Wells Outside Field Boundaries

In addition to the wells discussed above, two additional wells were drilled in the Monument, but outside of the described gas fields. The Federal 30-1 well was drilled east of the Leroy Gas Field and is currently shut in waiting on a pipeline. See further discussion regarding this well in Section 4.2.4 Central Leroy East Exploration/ Development Area. The Cow Creek Federal No.1 well was drilled and completed in 1968; however, because of a lack of market for the gas, this well was plugged and abandoned in 1978.

Table O.3-6 shows current natural gas activity in the Monument.

Exploration/Production Areas

Each of the fields includes productive areas that are referred to as exploration/production areas. Eighteen areas within the study area are used to describe historic, current and future exploration and development. In two of the areas (Cow Creek and Leroy One) no federal leases occur or ever will occur because of the Monument Proclamation. They are included for historical purposes to indicate the trend for oil and gas exploration and development of the area. The 18 areas are common to the Monument and are mostly contained within the Monument; however, some of the areas are both in and outside the Monument.

In addition to the wells drilled within the exploration/production areas, numerous other exploratory wells were drilled and abandoned outside of these areas because the wells had no shows of natural gas. Valuable information was gained from the abandoned wells because they further identified the subsurface resource. In some cases they are also included for informational purposes only and are referred to as Identification Wells in the tables which follow for each exploration/production area.

The potential for future drilling in each area was rated from low to high. The criteria were based on whether another well could be drilled in an already productive spacing unit or whether the spacing unit had a dry hole drilled previous to this report. The spacing units without wells drilled and adjacent to productive areas received a high potential for drilling. The spacing units with either a dry hole or a productive well received a low potential for drilling another well. Due to the complex structural geology and the possibility of drilling a producing gas well within a few acres of dry holes, exceptions could occur in the low potential drilling areas. All other areas were given a moderate potential for drilling another well (see Figure O.3-4).

It is reasonably foreseeable that natural gas wells could be drilled in 11 of the 18 exploration/production areas. Table O.3-7 presents each of the exploration areas by the chronological order in which the area was explored. Also see Figures O.3-4 and O.3-5 for the location of each exploration/production area.

Drilling and Completion Statistics

A summary of drilling in the 18 Exploration/Production areas described above is shown in Table O.3-8. Refer also to the information in the previous Exploratory/ Development Drilling section.

Production Statistics

Table O.3-9 provides a compilation of well summaries per area and cumulative production data for all of the wells drilled around the Monument study area as summarized below.

Table O.3-5
Historical Natural Gas Exploration and Development in the Monument

Natural Gas Wells	*Leroy Gas Field*	*Sawtooth Mountain Gas Field*	*Sherard Unit Area*	*Outside of Existing Fields*	*Total*
Drilled	41	2	12	83	138
Dry Holes (Abandoned)	29	2	9	81	121
Completed	12	0	3	2	17
Production	11	0	3	0	14
Shut-In without Pipeline	1	0	0	2	3
Completed Wells Plugged	6	0	0	1	7
Completed Wells Active	6	0	3	1	10
Production (BCF)	1.7	0	4.0	0	5.7

Table O.3-6
Current Natural Gas Activity in the Monument

Natural Gas Wells	*Leroy Gas Field*	*Sawtooth Mountain Gas Field*	*Sherard Unit Area*	*Outside of Existing Fields*	*Total*
Active Wells	6	0	3	1	10
Currently Producing	2	0	2	0	4
Shut-In with Pipeline	3	0	1	0	4
Shut-In without Pipeline	1	0	0	1	2

Table O.3-7
Exploration/Production Areas

Exploration/ Production Area (date 1st well drilled)	*Field Name*	*Area Description*	*General Remarks*
1 - Whiskey Ridge (October 1939)	Wildcat (not part of a field within the Monument)	SE¼NW¼, NE¼SW¼, S½NE¼, N½SE¼ Section 7; S½N½, N½S½ Section 8; S½N½, N½S½ Section 9; S½N½, N½S½ Section 10; S½N½, S½ Section 11; T. 22 N., R. 18 E. (1,660 acres)	Approximately a three square mile area where ten wells have been drilled including one active well (one shut-in gas well). Area approximately 40% in the Monument. Active federal leases are in the Monument in this area.

Table O.3-7
Exploration/Production Areas

Exploration/ Production Area (date 1st well drilled)	*Field Name*	*Area Description*	*General Remarks*
2 - North Leroy (March 1968)	Leroy	N½, SW¼, W½SE¼ Section 3; NW¼, W½NE¼, N½SW¼, NW¼SE¼; Section 10; T. 25 N., R. 20 E.; Section 14; N½ Section 15; N½ Section 16; NE¼ Section 17; E½SE¼ Section 22; Sections 23 and 26; E½E½ Section 27; E½ Section 34; W½W½ Section 35; T. 26 N., R. 20 E. (4,460 acres)	Approximately six and a half square mile area where 14 wells have been drilled including eleven active wells (two shut-in gas wells and nine producing gas wells). Area approximately 15% in the Monument. Active federal leases are in the Monument in this area.
3 - Central Leroy (July 1968)	Leroy	Section 12; N½N½ Section 13; N½, SW¼, W½SE¼ Section 14; S½ Section 15; SE¼ Section 21; Section 22; NE¼, W½ Section 28; Section 29; SE¼SE¼ Section 30; NE¼, E½NW¼, N½SE¼, NE¼SW¼ Section 31; NW¼ Section 32; T. 24 N., R. 20 E.; N½ Section 7; T.24 N., R. 21 E.; SE¼ Section 36; T. 25 N., R. 20 E.; SW¼, W½SE¼ Section 31; T. 25 N., R. 21 E. (4,500 acres)	Approximately seven and a half square mile area where nine wells have been drilled including three active wells (two producing gas wells and one shut-in). Area all in Monument. Active federal leases are in the Monument in this area.
4 - Central Leroy East (August 1968)	Leroy/ Wildcat	E½ Section 25; N½, N½S½ Section 36; T. 24 N., R. 20 E.; S½ Section 19; Section 20; W½ Section 29; Section 30; N½ Section 31; NW¼ Section 32; T. 24 N., R. 21 E. (3,150 acres)	Approximately five square mile area where two wells have been drilled including two active wells (two shut-in gas wells). Area all in Monument. Active federal leases are in the Monument in this area.
5 - Leroy-Bullwacker (August 1968)	Leroy	Sections 15, 16 and 17; E½SE¼ Section 18; E½E½ Section 19; W½, NE¼ Section 20; NW¼NW¼ Section 21; W½W½ Section 29; E½ Section 30; Section 31; T. 25 N., R. 20 E. (3,800 acres)	Approximately six square mile area where nine wells have been drilled including three active wells (one producing gas well and two shut-in gas wells). Area approximately 90% in the Monument. Active federal leases are in the Monument in this area.
6 – Cow Creek (September 1968)	Wildcat	NW¼ Section 2; Section 3; T. 25 N., R. 21 E. (820 acres)	Approximately one square mile area where one well was drilled as an active gas well and later plugged because the well did not justify a pipeline. Area all in Monument. No active federal leases within described area.
7 - Leroy One (Discovery well of the Leroy Gas Field – October	Leroy	SE¼ Section 12; NE¼ Section 13; T. 23 N., R. 18 E.; SW¼, W½SE¼ Section 7; NW¼, W½NE¼ Section 18; T. 23 N., R. 19 E. (620 acres)	Approximately one square mile area where four wells were drilled. The first of the four wells drilled in this area was the

Table O.3-7 Exploration/Production Areas			
Exploration/ Production Area (date 1st well drilled)	***Field Name***	***Area Description***	***General Remarks***
1968)			discovery well for the Leroy field. The other three wells were drilled and abandoned. Area all in the Monument. No federal active leases within described area.
8 – Sherard/ Northwest Leroy (May 1969)	Sherard & Leroy	Sections 1, 2, 3, 10, 11, 12; N½ Section 13; N½, SW¼ Section 14; Section 15; T. 25 N., R. 19 E.; W½, W½E½ Section 6; T. 25 N., R. 20 E.; S½ Section 26; Section 27; E½E½ Section 33; Sections 34, 35; S½ Section 36; T. 26 N., R. 19 E. (8,590 acres)	Approximately twelve and a half square mile area where twenty-one wells were drilled including eight active wells (seven producing gas wells and one shut-in gas well). Area approximately 55% in the Monument. Active federal leases within approximately 85% of the area.
9 - Leroy Two (June 1969)	Leroy	N½ Section 13; NE¼ Section 14; T. 25 N., R. 20 E. (470 acres)	Approximately one square mile area where two wells have been drilled, including one well that was drilled as an active gas well and later plugged because the well did not justify a pipeline. The other well was drilled and abandoned. Area all in Monument. Active federal lease in the Monument in Section 13.
10 – West Leroy (July 1969)	Leroy	N½ Section 2; T.23 N., R. 18 E. SE¼ Section 9; Sections 10 and 11; SW¼ Section 12; W½, W½E½ Section 13; Section 14; N½NW¼, E½ Section 15; E½W½, E½ Section 22; Section 23; W½, W½SE¼ Section 24; W½ Section 25; Section 26; E½ Section 27; E½ Section 34; Section 35; W½W½ Section 36; T. 24 N., R. 18 E. (7,120 acres)	Approximately eleven and a half square mile area where 40 wells have been drilled including nine active wells (six producing gas wells and three are shut-in). Area approximately 10% in the Monument. Active federal leases are in the Monument in this area.
11 - Sawtooth (June 1971)	Sawtooth Mountain	W½ Section 1; Section 2; Section 3, S½ Section 4; SE¼ Section 5, E½ Section 8; Section 9; Section 10; Section 11; NW¼ Section 12; T. 26 N., R. 20 E.; S½ Section 35; SW¼ Section 36; T. 27 N., R. 20 E.; T. 26 N., R. 20 E. (4,990 acres)	Approximately eight square mile area where eleven wells have been drilled including four active wells (producing gas wells). Area approximately 40% in the Monument. Active federal leases are in the Monument in this area.
12- Sherard Unit Area East (September 1971)	Sherard & Leroy	S½SE¼, SE¼SW¼ Section 23; Sections 24 and 25; E½, E½W½ Section 26; N½NE¼, NE¼NW¼ Section 35; N½N½ Section 36; T. 25	Approximately four square mile area where three wells have been drilled. Area includes no active wells. Area all in Monument.

Table O.3-7 Exploration/Production Areas			
Exploration/ Production Area (date 1st well drilled)	***Field Name***	***Area Description***	***General Remarks***
		N., R. 19 E.; NW¼ Section 19; T. 25 N., R. 20 E. (2,330 acres)	Area is held by production based on the Sherard Unit Production (allocated production). Active federal leases are in the Monument in this area.
13 - Southeast Leroy (August 1972)	Leroy	N½N½ Section 6; T. 22 N., R. 19 E.; SE¼ Section 21; Section 22; NW¼ Section 25; Sections 26, 27 and 28; E½ Section 29; S½ Section 31; N½, N½S½ Section 32; N½ Section 33; N½ Section 34; NW¼ Section 35; T. 23 N., R. 19 E. (5,380 acres)	Approximately eight square mile area where 21 wells have been drilled including eight active wells (five producing gas wells and three are shut-in). Area approximately 25% in the Monument. Active federal leases are in the Monument in this area.
14 - Chase Hill South (July 1973)	Wildcat	SW¼ Section 4; Section 5; N½ Section 8; Section 9; N½ Section 16; T. 23 N., R. 17 E.; Sections 29, 30, 31 and 31; T. 24 N., R. 17 E. (5,230 acres)	Approximately eight square mile area where six wells have been drilled including four active wells (four are shut-in). Area approximately 25% in the Monument. Active federal leases are in the Monument in this area.
15 - Leroy Three (August 1973)	Leroy	SE¼ Section 1; NE¼ Section 12; T. 25 N., R. 20 E.; SW¼ Section 6; NW¼ Section 7; T. 25 N., R. 21 E. (650 acres)	Approximately one square mile area where three wells have been drilled including one active well (one shut-in gas well). Area all in Monument. Active federal lease in Section 7.
16 - West Central Leroy (November 1974)	Leroy	SW¼SW¼ Section 15; SE¼ Section 16; E½ Section 20; Section 21; NW¼NW¼ Section 22; N½, SW¼, W½SE¼ Section 28; N½NE¼ Section 29; N½NW¼, NW¼NE¼ Section 33; T. 24 N., R. 19 E. (1,950 acres)	Approximately three square mile area where nine wells have been drilled including three active wells (two producing gas wells and one shut-in). Area approximately 35% in Monument. Active federal leases are in the Monument in this area.
17 - Sherard Unit (December 1974)	Sherard	Sections 27, 28 and 29; T. 25 N., R. 19 E. (1,910 acres)	Approximately three square mile area where eight wells have been drilled including four active wells (two producing gas wells and two shut-in gas wells). Area approximately 65% in Monument. Active federal leases are in the Monument in this area.
18 – Johnsons (July 1975)	Leroy/Sherard	Sections 9 and 10; N½N½ Section 15; N½N½ Section 16; T. 24 N., R. 19 E.; S½S½ Section 33; S½SW¼	Approximately two and a half square mile area where seven wells have been drilled including

Table O.3-7 Exploration/Production Areas			
Exploration/ Production Area (date 1st well drilled)	*Field Name*	*Area Description*	*General Remarks*
		Section 34; T. 25 N., R. 19 E. (1,620 acres)	two wells that were drilled as active producing gas wells and later plugged because of depleted production. The other five wells were drilled and abandoned. Area approximately 20% in Monument. No active federal leases within described area.

Figure O.3-4

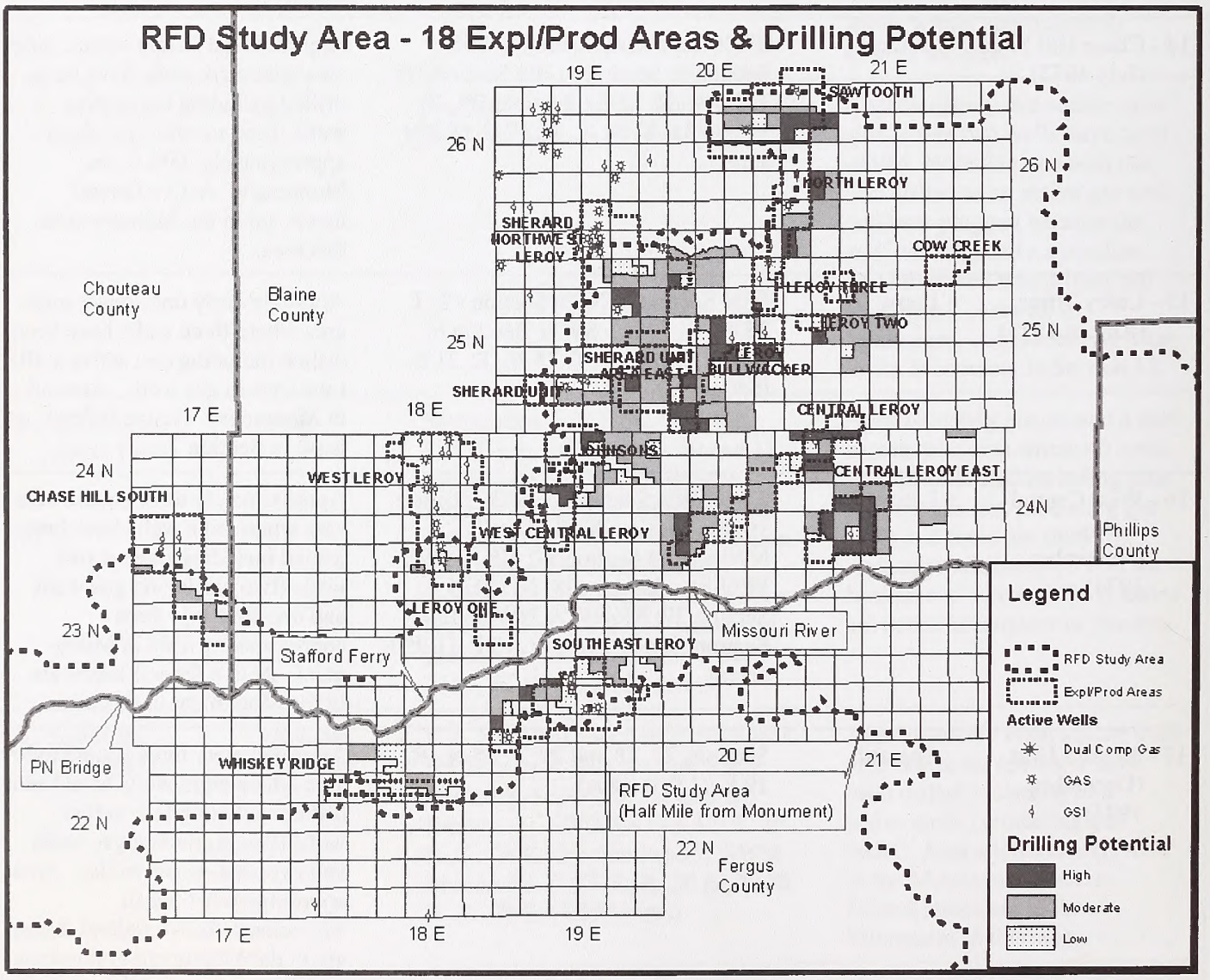


Figure O.3-5
West HiLine and Non-West HiLine Leases

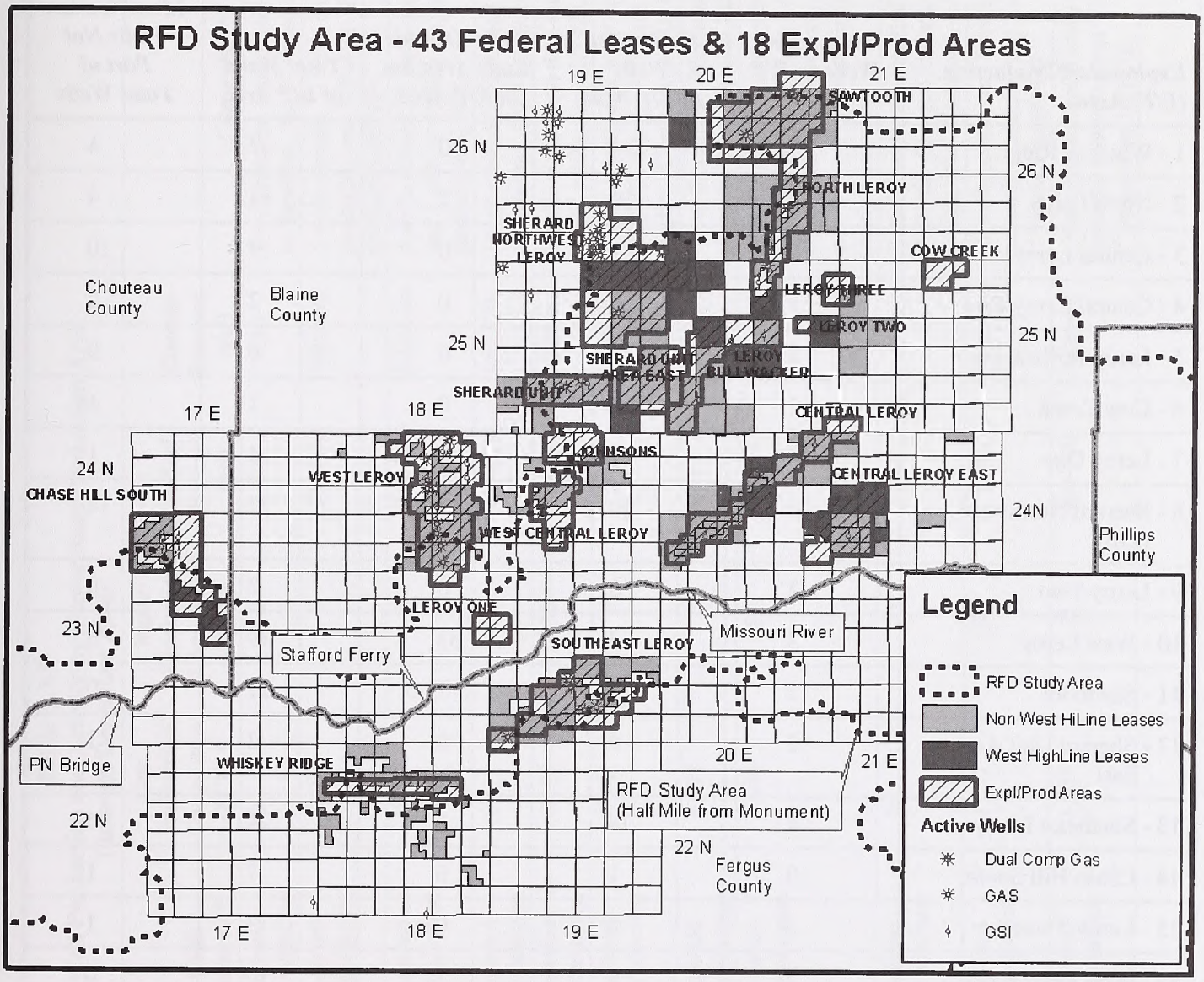


Table O.3-8 Exploration/Production Area Summary					
Exploration/Production (E/P) Area	*Monument Wells in E/P Area*	*Study Area Wells in E/P Area*	*Wells Outside Study Area but in E/P Area*	*Total Wells in E/P Area*	*Identification Wells Not Part of Total Wells*
1 - Whiskey Ridge	3	4	0	7	4
2 - North Leroy	2	10	2	14	4
3 - Central Leroy	8	1	0	9	10
4 - Central Leroy East	1	1	0	2	2
5 - Leroy Bullwacker	3	3	0	6	9
6 - Cow Creek	1	0	0	1	4
7 - Leroy One	4	0	0	4	1
8 - Sherard Northwest Leroy	6	10	11	27	14
9 - Leroy Two	2	0	0	2	0
10 - West Leroy	3	3	33	39	3
11 - Sawtooth	2	6	3	11	0
12 - Sherard Unit Area East	2	0	0	2	1
13 - Southeast Leroy	4	14	6	24	6
14 - Chase Hill South	0	1	6	7	1
15 - Leroy Three	3	0	0	3	1
16 - West Central Leroy	3	6	1	10	6
17 - Sherard Unit	5	2	1	8	2
18 - Johnsons	2	4	2	8	1
Total	54	65	65	184	69

Table O.3-9
Summary of Well Production and Activity by Exploration/Production Area
(through December 2006)

Area	*Field/ Reservoir*	*Wells Produced **	*Gas Production Cumulative (BCF) **	*Water Production Cumulative (BBLs)*	*Initial Pressure (psi)*	*Current Pressure (psi)*	*Comment ***
1 - Whiskey Ridge	Wildcat Eagle	1 completed 0 w/production	0	0	210	210	1 well remains shut-in and waiting on pipeline. No 1st production.
2 - North Leroy	Leroy Eagle	5 completed 5 w/production	0.502	0	200-560	Unknown	5 wells remain. 2 wells currently producing and 3 shut-in. 1st production 9/1994.
3 - Central Leroy	Leroy Eagle	3 completed 2 w/production	0.215	0	220-300	Unknown	3 wells remain. 2 wells are shut-in and 1 well is waiting on pipeline. 1st production 6/1996.
4 - Central Leroy East	Leroy/Wildcat Eagle	2 completed 0 w/production	0	0	160-320	160-320	1 well remains shut-in and waiting on pipeline. No 1st production.
5 - Leroy-Bullwacker	Leroy Eagle	3 completed 3 w/production	0.127	27,352	240-530	Unknown	2 wells remain and they are all shut-in. 1st production 12/1999.
6 – Cow Creek	Wildcat Eagle	1 completed 1 w/production	0.001	0	275	275	Tested 1 well with an IP of 500 MCFPD. Plugged for lack of market. 1st production 10/1968.
7 - Leroy One	Leroy Eagle	1 completed 1 w/production	0.477	0	382	Unknown	No wells remain. Well was plugged. 1st production 12/1980.
8 – Sherard/Northwest Leroy	Sherard & Leroy Eagle	3 completed 3 w/production	1.446	284	390-550	Unknown	11 wells remain and 8 wells are currently producing and 3 shut-in. 1st production 1/1974 (non study area well), 1st production 5/1998 (study area well).
9 - Leroy Two	Leroy Eagle	0 completed 0 w/production	0	0	143	151	Tested 1 well with an IP of 189 MCFPD. Plugged for lack of market. No 1st production.
10 – West Leroy	Leroy Eagle	2 completed 2 w/production	1.017	131	430	Unknown	15 wells remain and 8 wells are currently producing and 7 shut-in. 1st production 6/1978.
11 -Sawtooth	Sawtooth Mountain Eagle	3 completed 3 w/production	1.831	21	400-530	Unknown	3 wells remain and 3 wells are currently producing and 1 shut-in. 1st production 10/1976.

Table O.3-9
Summary of Well Production and Activity by Exploration/Production Area
(through December 2006)

Area	*Field/ Reservoir*	*Wells Produced **	*Gas Production Cumulative (BCF) **	*Water Production Cumulative (BBLs)*	*Initial Pressure (psi)*	*Current Pressure (psi)*	*Comment ***
12- Sherard Unit Area East	Sherard & Leroy Eagle	0 completed 0 w/production	0	0	0	0	No productive wells exist in this structure. Area based on geologic potential. No 1st production.
13 - Southeast Leroy	Leroy Eagle	10 completed 10 w/production	1.920	0	100-600	Unknown	6 wells remain and 5 wells are currently producing and 1 shut-in. 1st production 11/1983.
14 - Chase Hill South	Wildcat Eagle	0 completed 0 w/production	0	0	240	Unknown	4 wells remain shut-in and waiting on pipeline. No 1st production.
15 - Leroy Three	Leroy Eagle	1 completed 1 w/production	0.019	0	500	Unknown	1 well remains shut-in and waiting on well service. 1st production 6/1995.
16 - West Central Leroy	Leroy Eagle	5 completed 5 w/production	0.728	0	340-415	Unknown	1 well remains as an active producing well. 1st production 6/1978.
17 - Sherard Unit	Sherard Eagle	6 completed 5 w/production	4.314	2,780	110-440	Unknown	4 wells remain and 2 wells are currently producing and 2 shut-in. 1st production 9/1975.
18 – Johnsons	Leroy/Sherard Eagle	2 completed 2 w/production	0.039	0	300-460	Unknown	No wells remain. Wells were plugged. 1st production 6/1978.
Total		48 completed 43 w/production	12.6 BCF RFD study area wells. 5.7 BCF Monument wells only.	30,568	N/A	N/A	29 wells currently producing. 29 wells shut-in of which 7 are waiting on pipeline.

* Wells and production counted on Monument lands and within 1/2 mile of Monument lands.
** Includes all wells within the Exploration/Production areas that are currently active.

Horizontal/Deviated Drilling Practices

The practice of using horizontal and or deviated drilling has not customarily been used on previous wells drilled in the study area. The practice is, however, being used with success on similar Eagle/Judith River wells adjacent to the study area in the Sawtooth Mountain Field. It is believed that many of the future wells drilled in the Monument may use this technology to allow further development of areas not accessible to vertical drilling technology because of unstable soils or steep slopes, and to reduce the effects on Monument resources.

Oil and Gas Production Fluid Properties

No oil or gas condensate has been produced from the Monument. The gas produced from the Monument is a dry sweet gas that does not yield condensate. No hydrogen sulfide gas (H2S) is contained in the gas produced from the Monument. As shown in Figure O.3-6, production of gas from the Monument began in September 1975 and continues to date. As of December 2006, 12.6 BCF had been produced from the 14 Monument wells and 28 wells within 1/2 mile of the Monument, and 5.7 BCF was produced from Monument wells only.

Oil and Gas Pricing

Exploration and development in the study area is highly dependent upon gas pricing. Initial development of the fields in the late 1960s took place at a time when gas prices were low (Figure O.3-7). Initial production from the study area occurred in late 1975 and participated in relatively good prices for fourteen years. The excess gas supply in North America, sometimes called the "gas bubble" of the late1980s and throughout the 1990s, depressed natural gas prices during the later stages of production in the study area with only a few wells being drilled each year through the late 1980s and 1990s. (Also see Figure O.3-3 for comparison.)

Recent events indicate that the "gas bubble" no longer exists and natural gas prices have exceeded $3/MCF in the Montana. Current commodity prices provide a very positive economic incentive for oil and gas operators to explore and develop natural gas prospects in the study area. For the purpose of analyzing the economics for exploring and developing natural gas in the study area, the following prices were used:

Untreated Natural Gas $2.50/MCF to $8.50/MCF

Since it is believed that volatility remains for natural gas pricing and natural gas is the primary revenue stream for wells in the study area, a sensitivity analysis was conducted whereby the gas price was varied from $2.50/MCF up to $8.50/MCF for untreated natural gas. Per the Department of Energy projections out to 2025, natural gas prices are projected to decline form the 2004 levels down to $3.64 per MCF in 2010 and then increase to $4.79 per MCF in 2025.

Finding and Development Costs

Given the varying degrees of reservoir sizes in the study area, production profile "type curves" were generated for a reservoirs that varied in size from 26 million cubic feet (MMCF) of natural gas up to reservoirs with greater than 500 MMCF (0.5 BCF). The productivity of each producing well was varied depending on the size of reservoir based on data from the study area. For reservoirs within the study area, three ranges were used to determined economics. The ranges were:

- 0 - 100 MMCF, and it was determined that production for wells in this range had average exponential decline rate of 47%;
- 100 – 500 MMCF, and it was determined that production for wells in this range had an average exponential decline rate of 26%; and
- 500 MMCF and greater and it was determined that production for wells in this range had an average exponential decline rate of 14%.

Holding well costs, monthly operating costs, economic limits, severance taxes, discount rates and royalty rates constant, and varying the price of gas and the size of the reservoir under each of the three ranges, yields economics for wells in the study area as shown in Table O.3-10 and Figures O.3-8 through O.3-10. The assumed constants in this review are the following:

Well Cost	$120,000
Monthly Operating Cost	$1,000
Economic Limit – MCFPM	60
Severance Tax - %	9.3
Discount Rate - %	11.25
Royalty Rate - %	12.5
Well Decline rates varied between the ranges	47%, 26%, and 14%

Based on the information presented in Figures O.3-8 through O.3-10, it is evident that the diagrams are for the purpose of evaluating wells with small reservoir potential (i.e., 100 MMCF or less). Using the information in Figure O.3-8, a well with 34.5 MMCF would be considered a break even well, if the price of gas remained at $6.50/MCF. If the price fell below the $6.50/MCF a well with 34.5 MMCF would become subeconomic. For wells with reserves of 100 MMCF and greater the necessary price of natural gas to break even is significantly below current gas prices ($2.60/MCF, $4.00/MCF and $4.60/MCF) for each respective case.

Figure O.3-6

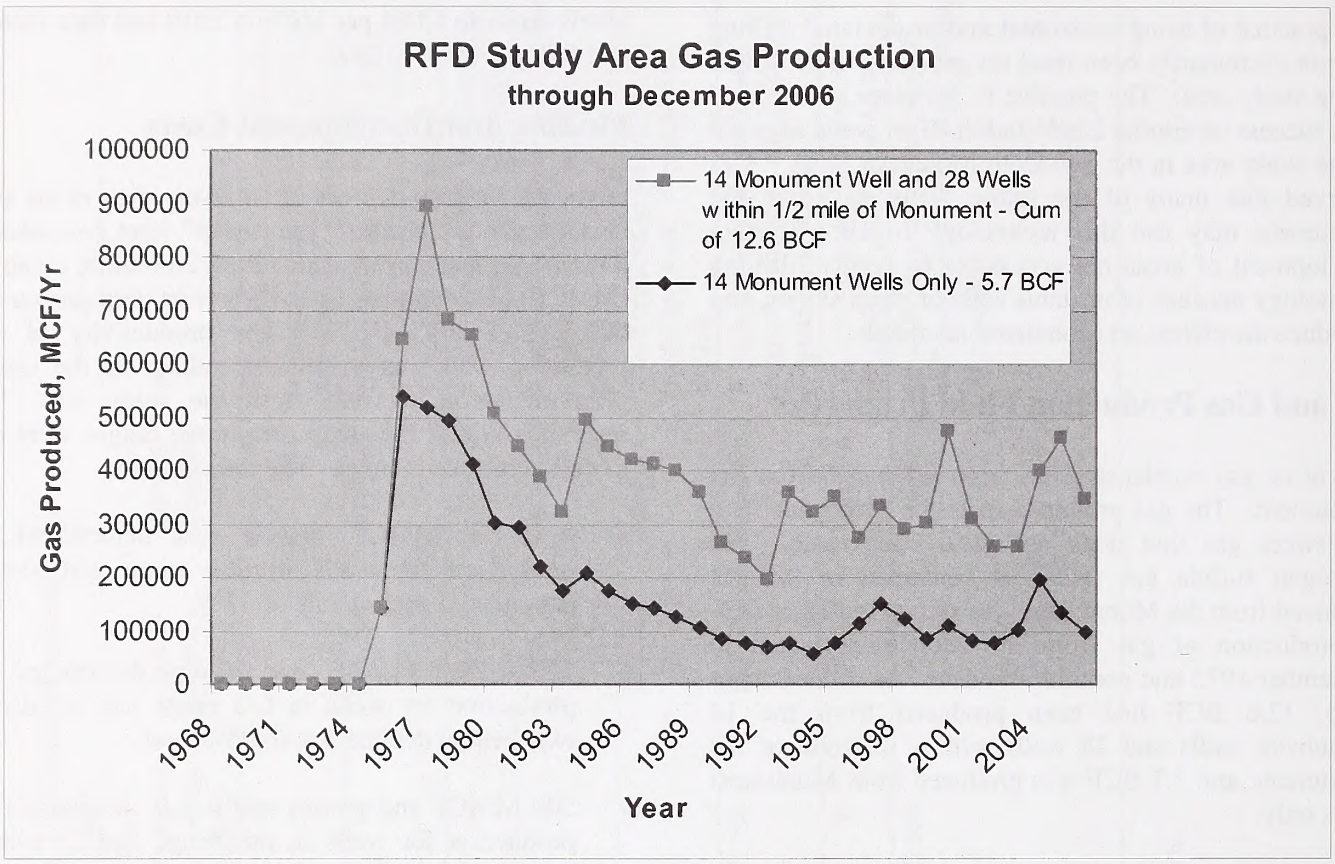
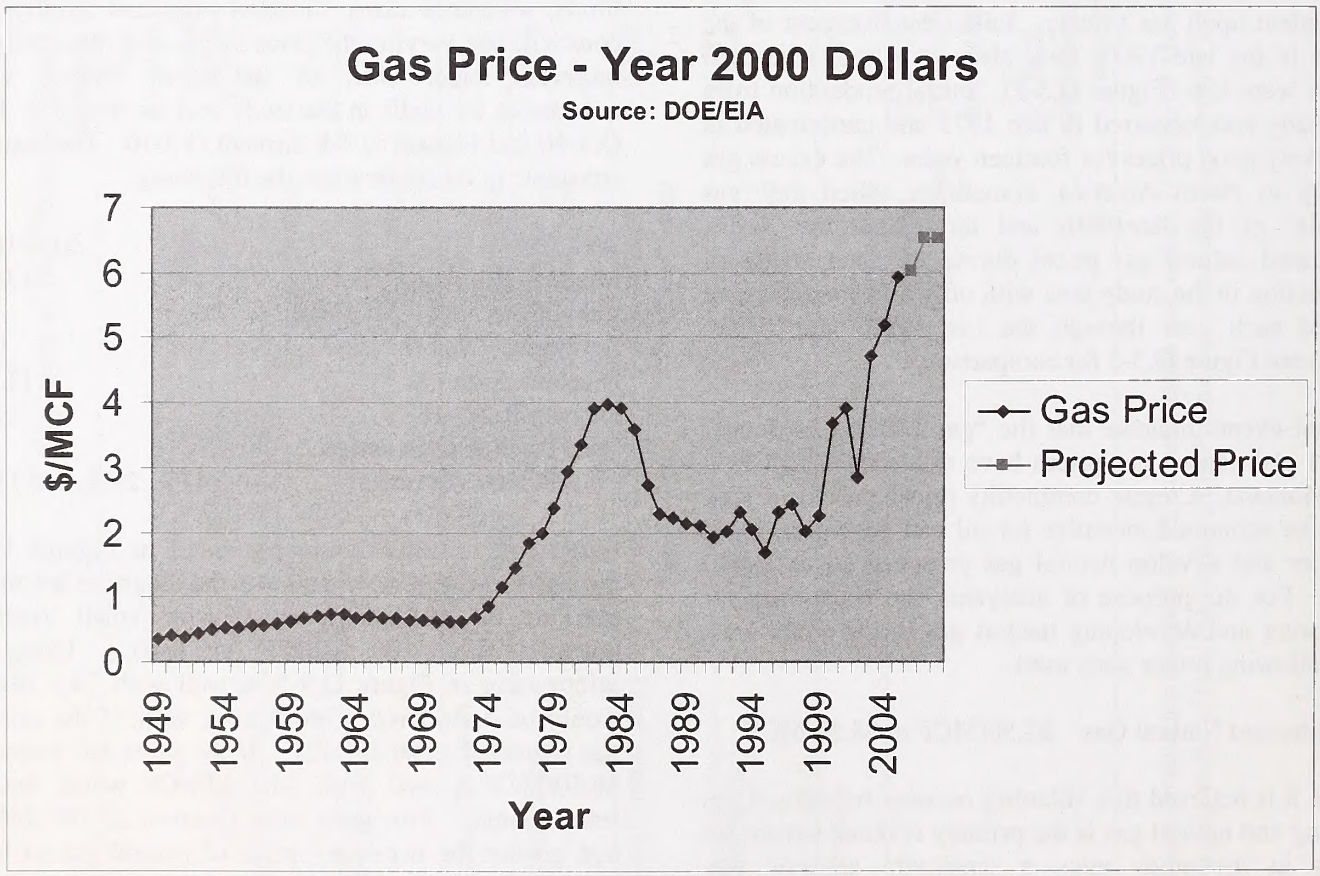


Figure O.3-7



Source: Annual Energy Outlook with Projections to 2025, Energy Information Administration, Annual Energy Review 2005. www.eia.doe.gov/oiaf/aeo/gas

Table O.3-10 Well Economics			
Natural Gas Price $/MCF	*0-100 MMCF Break Even Reserve at the Given Gas Price*	*100-500 MMCF Break Even Reserves at the Given Gas Price*	*500 MMCF and Greater Break Even Reserves at the Given Gas Price*
	Decline of 47%	Decline of 26%	Decline of 14%
$2.50	106,800 MCF	146,200 MCF	191,100 MCF
$4.50	55,600 MCF	78,200 MCF	101,600 MCF
$6.50	34,500 MCF	63,000 MCF	67,800 MCF
$8.50	25,800 MCF	39,000 MCF	46,100 MCF
	Figure O.3-8	Figure O.3-9	Figure O.3-10

Figure O.3-8

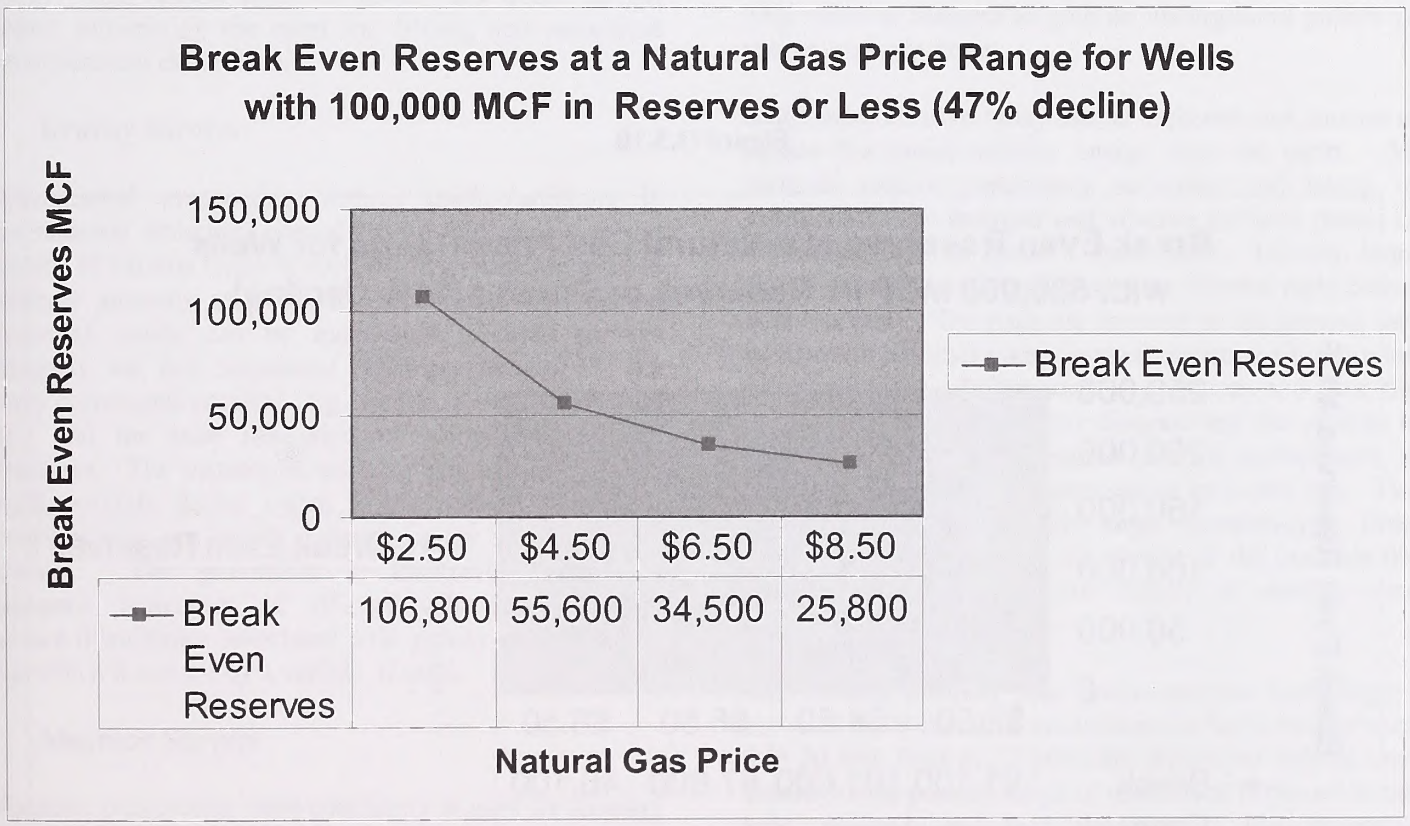


Figure O.3-9

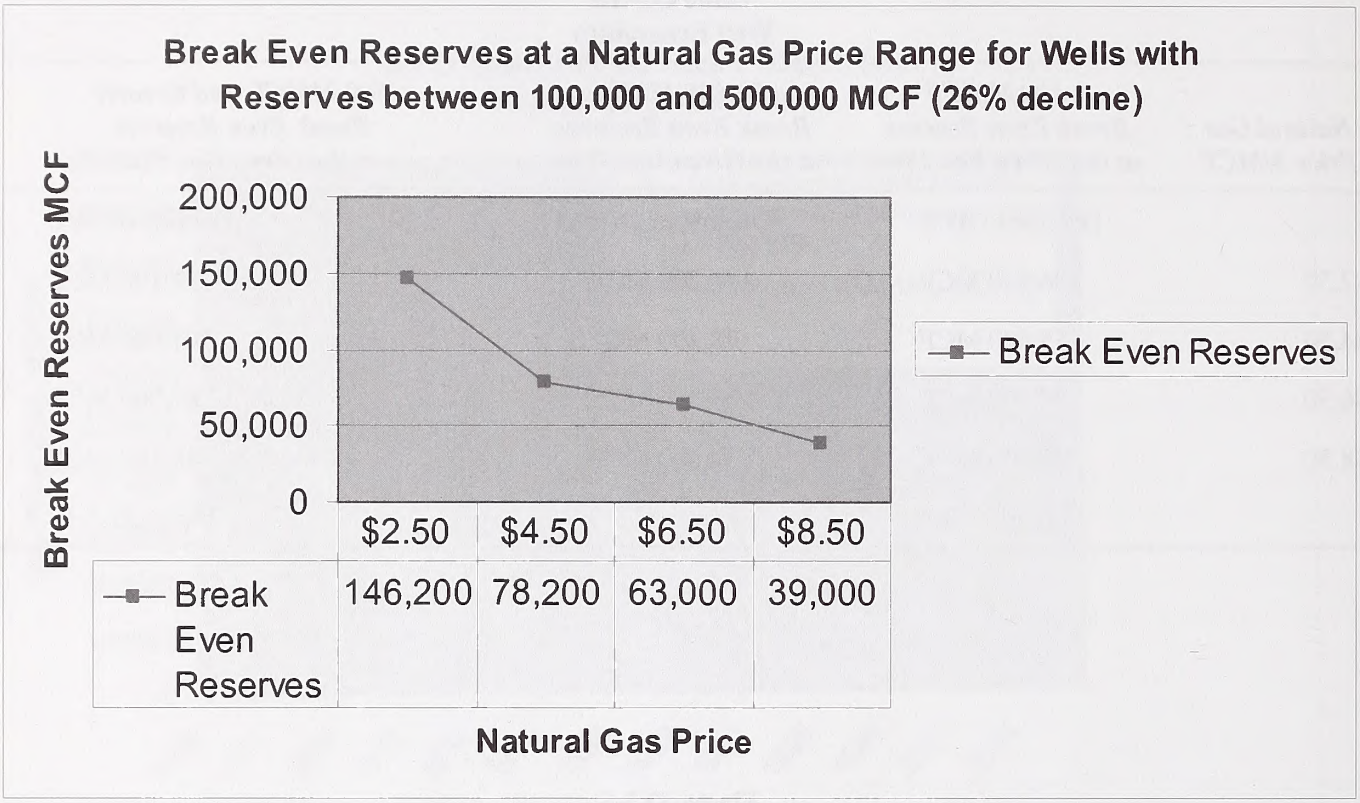
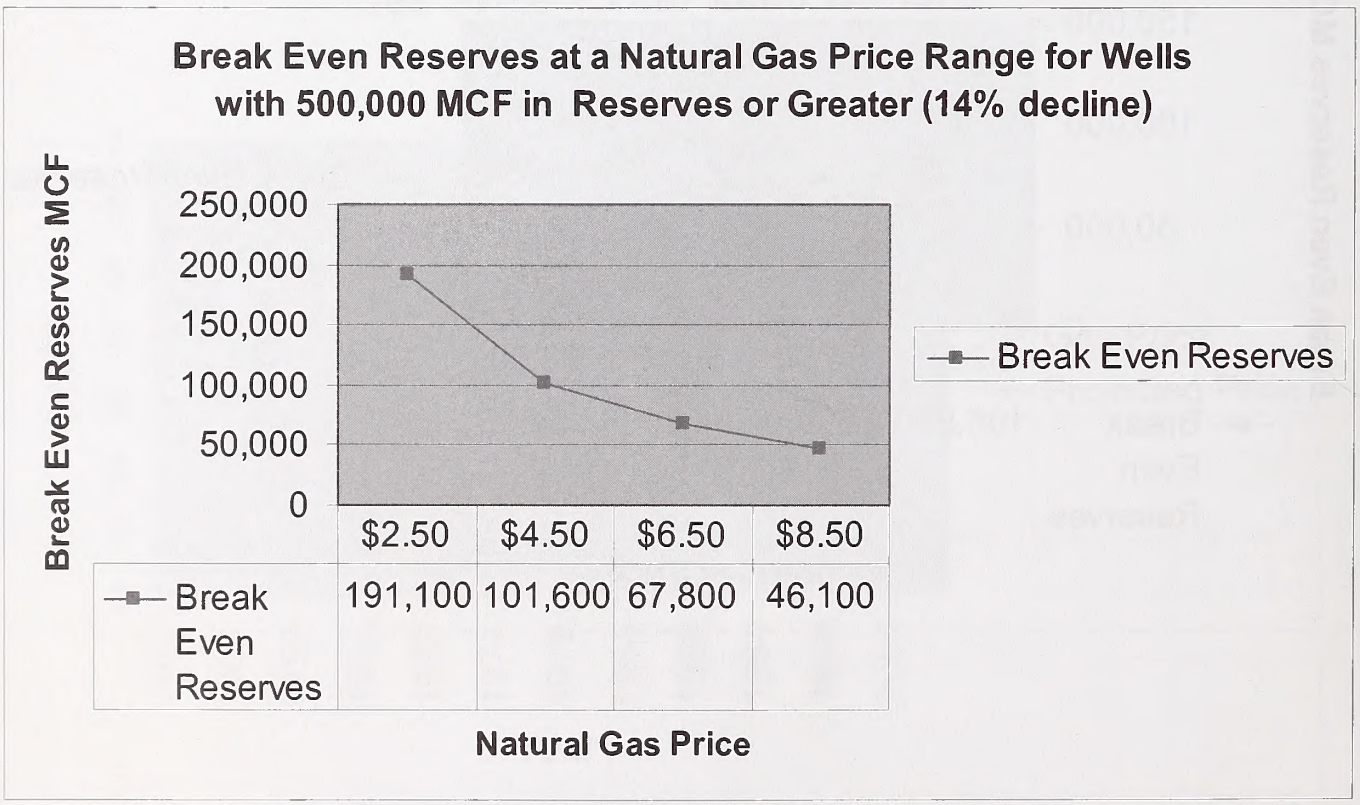


Figure O.3-10



Reasonable and Foreseeable Oil and Gas Operations

Geophysical Exploration Methods

Oil and gas can be discovered by either direct or indirect exploration methods, such as geologic surface mapping, seeps, well data, and remote sensing data. In many cases, indirect methods, such as seismic, gravity, and magnetic surveys, are required to delineate subsurface features that may contain oil and gas. Geophysical exploration provides information that increases the chances of drilling a discovery well, as well as information that may discourage drilling and the associated surface disturbance. A more sophisticated geophysical technique, such as a three-dimensional (3-D) seismic survey, is an intensive data acquisition and computer synthesis system used to analyze and three-dimensionally depict subsurface geologic structures/stratigraphy. This technique is capable of locating and displaying unknown subsurface pools or pockets that potentially could contain producible hydrocarbons. Data obtained through 3-D geophysical data acquisition should enable wells to be drilled with a much greater probability of locating producible hydrocarbons than is attainable via previous methods, such as two-dimensional (2-D) seismic data and wildcat wells. This should result in fewer "dry holes" in the future, minimizing the need for drilling and associated environmental disturbance.

Gravity Surveys

Gravitational prospecting detects micro-variations in gravitational attraction caused by the differences in the density of various types of rock. Gravity data are used to generate anomaly maps from which faults and general structural trends can be interpreted. These surveys generally are not considered definitive because of the many corrections required (e.g., terrain, elevation, latitude, etc.) and the poor resolution of complex subsurface structures. The instrument used for gravity surveys is a small portable device called a gravimeter. Generally, measurements are taken at many points along a linear transect. The gravimeter is transported either by backpack, helicopter, or off-road vehicle. The only surface disturbance associated with gravity prospecting is that which is caused by a vehicle, if used.

Magnetic Surveys

Magnetic prospecting most commonly is used for locating metallic ore bodies. It is used to a limited extent in oil and gas exploration. Magnetic surveys use an instrument called a magnetometer to detect small magnetic anomalies caused by mineral and lithologic variations in the Earth's crust. These surveys can detect trends in basement rock and the approximate depth to basement rocks but, in general, they provide little specific data to aid in petroleum exploration. Many corrections are required to obtain reliable information. The generated maps lack high resolution and provide rudimentary views of subsurface geology. Magnetometers vary greatly in size and complexity and, in general, most magnetic surveys are conducted from the air by suspending a magnetometer under an airplane. Magnetic surveys conducted on the ground are nearly identical to gravity surveys; surface disturbance is minimal to nonexistent.

Seismic Reflection Surveys

Seismic prospecting is the best and most popular indirect method used for locating subsurface structures and stratigraphy that may contain hydrocarbons. Seismic energy (shock waves) is induced into the earth using one of several methods, typically shot holes or vibrators. As these waves travel downward and outward, they encounter various rock strata, each having a different seismic velocity characteristic. As the wave energy encounters the interface between rock layers where the lower layer is of lower seismic velocity, some of the seismic energy is reflected upward. Sensing devices, commonly called geophones, are placed on the surface to detect these reflections. The geophones are connected to a recording truck that stores the data. The time required for the shock waves to travel from the shot point down to a given reflector and back to the geophone is related to depth. This value is mapped to give an underground picture of the geologic structure.

Many methods exist today that an explorationist can use to induce the initial seismic energy into the earth. All methods require preliminary surveying and laying of geophones. The thumper and vibrator methods pound or vibrate the earth to create a shock wave. Usually, large trucks are used, each equipped with vibrator pads (about 4-feet square). The pads are lowered to the ground, and vibrators on all trucks are triggered electronically from the recording truck. Information is recorded, and then the trucks move forward a short distance and the process is repeated. Less than 50 square feet of surface area is required to operate the equipment at each test site. The trucks are equipped with large flotation-type tires, designed to further spread the weight of the truck on the surface, which reduces the impact of driving over undisturbed terrain.

The drilling method uses truck-mounted and buggy-mounted drills that drill small-diameter holes to depths of 5 to 20 feet. Four to 12 holes are drilled per mile of line. Usually, a 30-pound charge of explosives is placed in the hole, covered, and then detonated. The detonated explosive sends a shock wave below the earth's surface that subsequently is reflected back to the surface from various subsurface rock layers. In rugged topography, a buggy-mounted drill is used or a portable drill is carried in by helicopter or by foot. Charges are placed in the hole as is done in a truck-mounted operation. In remote areas where there is little known subsurface data, a series of

short seismic lines may be required to determine the subsurface geology. Subsequently, more extensive seismic lines are arranged to obtain the greatest amount of geologic information. Seismic information can be obtained in 2-D or 3-D configurations. To obtain 3-D seismic information, the seismic sensors and energy source are located along lines in a grid pattern. This type of survey differs from the more common 2-D surveys because of the large volume of data and the intensive computerization of the data. The results are expensive to obtain but give a more detailed and informative subsurface picture. T he orientation and arrangement of the components in 3-D seismic surveys are less tolerant of adjustments to the physical locations of the lines and geophones, but they are also more compact in the area they cover. Although alignment can be fairly critical, spacing of the lines often can be changed to increase the information collected. The depth of the desired geologic information will dictate the spacing of the grid lines, with smaller spacing detailing shallower formations. The 3-D surveys are very expensive and usually conducted after 2-D surveys or drilling has delineated a geologic prospect that will justify the extra cost. Extensive computer processing of the raw data is required to produce a useable seismic section from which geophysicists can interpret structural relationships to depths of 30,000 feet or more. The effective depth of investigation and resolution are determined to some degree according to the method used.

A typical drilling seismic operation can use 10 to 15 men operating five to seven trucks. Under normal conditions, three to five miles of line can be surveyed each day using the explosive method. The vehicles used for a drilling program include several heavy truck-mounted drill rigs, water trucks, a computer recording truck, and several lightweight pickup trucks for the surveyors, shot-hole crew, geophone crew permit person, and party chief. Helicopters are used to lay out and pick up recording equipment.

Public roads, existing private roads, and vehicle routes can be used. Off-road travel may be necessary to carry out tasks. Motor graders and/or dozers may be required to provide access to remote areas. Concern about unnecessary surface disturbance has prompted government and industry personnel to plan surveys more carefully. As a result, earth-moving equipment is now rarely used in seismic exploration work. Several trips a day are made along a seismograph line. The repeated movement back and forth along the line (particularly by the lightweight pickup trucks) usually establishes a well-defined two-track vehicle route. Spreading vehicles out so that vehicle routes are not straight and vehicles do not retrace the same route has, in some cases, prevented the establishment of new vehicle routes, thus reducing impacts. Drilling water, when needed, usually is obtained from private landowners.

Each of the foregoing exploration methods has inherent strengths and weaknesses, and explorationists must decide which method will produce the most useful information, while being practical in regard to surface constraints (such as topography). Economics and past information also play a role in determining which method should be used. Reconnaissance-type gravity and geomagnetic surveys can be conducted in areas where little information is available with the attendant lower costs and fewer impacts. More expensive and higher impact seismic surveys are conducted when more detailed information is required.

Geophysical Management (Permitting Process)

Geophysical exploration on BLM public lands is covered under the regulations at 43 CFR 3150 – Onshore Oil and Gas Geophysical Exploration. Geophysical operations can be done prior to the issuance of a lease. More specifically, regarding potential geophysical work to be done in the Monument, it would likely be done in or near (within 1/2 mile of) an existing lease whether that lease be private, state or federal and follow the conditions of approval as stated in the Monument RMP/EIS. Because the Monument Proclamation withdrew future leasing from lands in the Monument, this removed a major part of the reason for conducting future pre-oil and gas lease geophysical work on the unleased federal lands in the Monument. Off-lease seismic operations or seismic operations on BLM land with unleased federal minerals may be permitted for the purpose of defining the limits of the federal lessee's interests or for the purpose of exploring state and private oil and gas minerals. Seismic operations planned off of existing roads must demonstrate that proposed transportation and exploration methods will minimize the potential for creating new roads or trails.

Twelve of the leases in the Monument were leased under the West HiLine RMP and are being reviewed under Alternative E where no surface-disturbing or disruptive activities would be allowed and Alternative E (No Lease) where the leases would not have been allowed. Under Alternative E, it is likely that no on-lease geophysical operations would take place because under this alternative, no wells are allowed to be drilled. Since the alternative removes the incentive to conduct seismic in the first place, the seismic would likely not occur. Also under this alternative, seismic operations could be permitted on federal lands for the purpose of exploring state and private oil and gas minerals; however, it is also believed under this alternative that oil and gas companies would forego this opportunity too because by removing the majority of the potential resource from the table, they would be less likely to conduct geophysical surveys for a smaller piece of the pie. Under Alternative E (No Lease), there would be very little difference from Alternative E, since again all of the incentives are removed to do geophysical work. Alternative E (No Lease) applies only to the 12 West HiLine leases.

The responsibilities of the geophysical operator and the BLM are as follows:

Geophysical Operator – An operator is required to file with the appropriate BLM office a "Notice of Intent to Conduct Oil and Gas Geophysical Exploration Operations" (Notice of Intent). The Notice of Intent shall include a map showing the location of the line(s), all access routes, and ancillary facilities. The party filing the Notice of Intent shall be bonded. A copy of the bond or other evidence of satisfactory bonding must accompany the Notice of Intent. For geophysical operation methods involving surface disturbance, a cultural resources survey also is required. A pre-work field conference may be conducted. Earth-moving equipment shall not be used without prior approval. Upon completion of operations, including required reclamation, the operator is required to file a "Notice of Completion of Oil and Gas Geophysical Exploration Operations". If an operator/lessee planned on completing seismic activity as part of a lease activity, a Sundry Notice would be required to be filed along with a Notice of Intent and appropriate National Environmental Policy Act (NEPA) documentation would be need to completed prior to approval.

BLM – The BLM must contact the operator after the Notice of Intent is filed and apprise the operator of the practices and procedures to be followed prior to commencing operations on BLM-administered lands. After the operations are completed, as specified by the Notice of Completion, the BLM shall complete a final inspection and notify the operator if the terms and conditions of the Notice of Intent have been met or that additional action is required. Consent to release the bond or termination of liability shall not be granted until the terms and conditions have been met.

State Standards

In Montana, the operator is required to register with the Montana Department of Natural Resources and Conservation (MT-DNRC). MT-DNRC standards for plugging shot holes, personnel safety, and so on, would be followed as specified in the State Permit.

Mitigation

Seasonal restrictions are imposed to reduce conflicts with wildlife, watershed damage, and hunting activity.

The most critical management practice is compliance monitoring during and after seismic activity. Compliance inspections during the operation ensure that stipulations are being followed. Compliance inspections upon completion of work ensure that the seismic lines are free of trash and the drill holes are plugged properly.

Drilling Permit Process

The federal lessee or operating company selects a drill site based on spacing requirements, subsurface and surface geology, geophysics, topography, and economic considerations. Statewide spacing regulations are established by the Montana State Board of Oil and Gas Conservation and are generally as follows:

> Gas Wells: One well per 640 acres unless covered by one of the existing gas fields or Board orders. Exceptions to spacing requirements involving federal lands may be granted after a BLM review.

Notice of Staking (NOS)

Once the company makes the decision to drill, they must decide whether to submit a Notice of Staking (NOS) or apply directly for a permit to drill. The NOS is an outline of what the company intends to do, including a location map and sketched site plan. The NOS is used to review any conflicts with Monument resources. The BLM utilizes information contained in the NOS and obtained from the onsite inspection to develop stipulations to be incorporated into the APD. Under the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act of 1987), upon receipt of an NOS the operator/company name, well name/number, well location and a map showing the drill site must be posted in a public place for a minimum of 30 days prior to approving the APD.

Application for Permit to Drill (APD)

The operator may or may not choose to submit an NOS; in either case, an APD must be submitted. An APD consists of two main parts: the 13-point surface plan that describes any surface disturbances and is reviewed by resource specialists, and the eight-point plan that details the drilling program and is reviewed by the petroleum engineer and geologist. For the APD option the onsite inspection is used to assess possible impacts and develop conditions of approval to minimize these impacts. During the onsite inspection and selection of the potential drill site, it is feasible to see four to six vehicles present. The people at the onsite function will typically include representatives of the company and the BLM, along with the private land owner (if applicable), dirt contractor, drilling contractor representative, and contract archaeologist. If the NOS option is not utilized the 30-day posting period, as required by the Reform Act of 1987, will commence upon receipt of the APD by the BLM. Regardless of whether the NOS option or APD option is followed, an onsite inspection is conducted for every federal well proposed.

For oil and gas activity involving surface-disturbing operations, an archaeological clearance is required.

However, there may be exceptions to this policy on a case-by-case basis. Additionally, the BLM must prepare any site-specific environmental documentation required by NEPA and develop mitigation measures necessary to protect Monument resources. The BLM approves all wells drilled on federal minerals regardless of surface ownership, which would include private lands intermingled with the Monument that have federal mineral ownership. For privately owned surfaces it is the responsibility of the operator to obtain a surface owner agreement.

Drilling Phase

Once the APD is approved, the operator may begin construction activities. When a site is chosen that necessitates the construction of an access road, it is usually planned over the shortest feasible route and would attempt to avoid steep slopes. Best Management Practices (BMPs) will be followed. In some cases BMPs or a landowner's wishes may dictate a longer route.

During this first phase the operator moves construction equipment over existing roads to the point where the access road begins. Depending upon the type of terrain, equipment may include dozers (track-mounted and rubber-tired), scrapers and graders. Existing roads and trails often require improvement in places and occasionally culverts and cattle guards are installed. Because of the topography and the shallow depth of wells (1,500 to 2,200 feet) they can be drilled using a truck-mounted rig, which oftentimes means very little or no access road work is necessary and this phase of construction requires very little time.

The second phase is the construction of the drilling pad or platform. Much of the study area has steep slopes and some dirt work will be is necessary to prepare a safe drill pad (usually it takes less than a day to construct the road and the well pad). In some cases no disturbance is required other than a mud (reserve) pit and cellar. If surface disturbance is necessary, soil material suitable for plant growth is removed and stockpiled in a designated area, to be used later for reclamation. Drilling sites on ridge tops and hillsides are constructed by cutting and filling portions of the location after the topsoil has been removed. The excess cut material is stockpiled in an area that would allow recovery for reclamation.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, but is usually 200 feet by 250 feet for typical wells of 1,500 to 2,200 foot depths. Deeper wells may require larger pads because of the rig size and associated equipment. When construction of a drilling location requires cut and fill, the foundation of the drilling derrick is usually placed on a cut surface ensuring that it rests on solid ground, thereby preventing it from leaning or toppling due to settling of uncompacted soil.

In addition to the drill pad, a reserve pit may be constructed to contain drilling fluids and drill hole cuttings. It is usually square or oblong, but is sometimes constructed in other shapes to accommodate topography. Generally, the reserve pit is 6 to 12 feet deep by 15 to 20 feet wide by 40 to 50 feet in length. For air drilling, smaller reserve pits are used, usually less than 10 feet by 10 feet and approximately 6 to 10 feet in depth. In some instances steel tanks are utilized which eliminate the need for a pit.

Depending on how the drill site is located relative to a natural drainage, it may be necessary to construct water bars or diversions to control surface runoff and erosion. The area disturbed for construction and the potential for successful revegetation depends largely on topography, soil type, climate and the degree of disturbance.

Typical equipment used for drilling well in the Monument includes the following:

Drill Pad Construction:

- Cat-type dozer and backhoe. Two semi-loaded trailers used to transport these pieces of equipment.
- Two 3/4-ton pickup trucks can also be used as support vehicles.

Drilling Operations Equipment:

- Drill rig (including a 55-86 foot freestanding mast) either truck-mounted or trailer-mounted and elevated anywhere from five to nine feet above ground level, powered by a diesel engine with a power rating from 280 to 420 horsepower.
- Mud pump, powered by a diesel engine with a power rating from 350 to 600 horsepower.
- Diesel electric generator for lights and other electrical equipment with a power rating from 150 to 400 horsepower.
- Other support equipment such as a mud and chemical trailer, dog house, drill pipe racks, water tanks, mud tanks, fuel tanks, two to three camp trailers, and a portable latrine.

Eight to ten semi-loads are required to move in and rig up an operation with up to six additional 3/4-ton pickup trucks for support.

During casing and cementing operations a semi-type cement bulk truck, cement pump truck and 3/4-ton truck could come on to location twice during the operation: once for running and cementing the surface casing, and another time for running and cementing the production casing operations if a successful well is drilled.

Some drilling operations may require that the well safety equipment (blowout preventer equipment, or BOPE) be tested by a third party rather than the equipment at the drill rig. This would require the need for a one-ton type truck at the location for a minimum of four hours.

A 4-ton truck is required to perform a petrophysical survey (formation evaluation) of the well bore. This is normally conducted after the well reaches total depth.

Once the well is cased with pipe and cemented back to the surface, the drill rig and support equipment rig down and move on to the next location, usually within a half day after the decision to move. If the well is determined to not be a commercial well, it will be plugged while the drill rig is on location (see Plugging and Abandonment of Wells).

Drilling Operations

Water for drilling is hauled or piped to the rig storage tanks or reserve pit from rivers, wells, reservoirs or private sources. The volumes of water required for drilling wells in the Monument is 200 to 300 barrels (BBLs). Occasionally, water supply wells are drilled on or close to the drill site. Bentonite, a type of clay, is mixed with the water to form the main constituent of the drilling mud. A wide variety of other materials and chemicals may be added to enhance the mud properties. Drilling mud performs several important functions; it cools the bit, reduces the drag of the drill pipe on the sides of the bore hole and seals off any porous zones, aids in preventing an uncontrolled release of formation fluids, and carries the cuttings to the surface.

High pressure air is sometimes used in place of mud. The use of mud or air is largely dependent upon the target formation, drilling depth and type of completion desired. The drilling mud or air is circulated through the drill pipe to the bottom of the hole, through the bit and up the well bore. At the surface the mud and rock cuttings are returned to the reserve pit where gravity separates the two or they are mechanically separated through a screen. The mud is recycled and returned to the system for further use. When drilling with air, the cuttings are blown into another pit called the blooie pit, where compressed air and cuttings leave the drill system. By regulation, this pit or discharge point is to be located no closer than 100 feet to the well bore. Drilling muds are not allowed to contain any hazardous or toxic substances.

The actual commencement of the drilling is referred to as spudding in. Initially, the drilling usually proceeds rapidly due to the unconsolidated nature of shallow formations.

Drilling is accomplished by rotating special bits bearing a controlled portion of the drill string weight. The rig structure and associated hoisting equipment bear the remainder of the drill string's weight. The weight on the bit is controlled to maintain as vertical a hole as possible or deviate from vertical when desired, and to prevent rapid wearing of the drill bit.

The combination of rotary motion, hydraulic jet action of mud through the bit and weight on the bit causes rock to be chipped away at the bottom of the hole. As mentioned earlier, these chips are then transported to the surface via the mud or compressed air where they are disposed of in the reserve pit or blooie pit.

The rotary motion is created either by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table or a top drive hydraulic unit that turns the drill pipe. The rotary table sits on the drilling rig floor and as the hole is deepened the kelly descends. When the kelly has gone as deep as it can, it is raised and a piece of drill pipe about 30 feet in length is attached to the drill pipe in the hole. The drill pipe is then lowered, the kelly is raised and attached to the top of it, and drilling recommences. By adding more and more drill pipe the hole is steadily deepened.

Eventually, the bit becomes worn and must be replaced. To change bits, the entire string of drill pipe must be pulled from the hole. Once the bit is replaced the drill string is reassembled, lowered into the hole and drilling is started again.

Drilling operations are continuous, 24 hours a day, seven days a week. The crews usually work three 8-hour shifts or two 12-hour shifts a day. Typical wells in the area require three to four days to reach total depth. At periodic intervals BLM personnel, usually petroleum engineering technicians, will conduct inspections of the drilling rig and operations to ensure compliance with the approved plans in the APD and regulations.

Completion Operations

Upon completion of drilling, the well is tested to determine its capability to produce oil and gas. If oil or gas is found in commercial quantities the well is completed as a producer. Completion operations can begin as early as one week after the drill rig moves off location, but they normally occur within two to three weeks.

The typical equipment used for completing a well in the Monument includes the following:

- Wire line truck and mast trailer (~30 tons combined) used to determine the depth of the zone of interest and perforate the well (to expose the formation with natural gas in it to the well bore)
- 3/4-ton support truck
- Workover unit (semi-mounted mast) used to hoist tubing in and out of the well
- Stand-alone air compressor unit
- Supply trailer
- Tubing trailer
- Two 3/4-ton trucks

Or, in place of the workover unit, a semi-mounted coiled tubing unit which includes the following:

- Air compressor
- Coil tubing
- Reel and injector head
- Catch tank trailer to catch any formation water or make up water that is blown off the well
- Two 3/4-ton support trucks

It normally takes about a day to perforate the well and run tubing. Depending on the well, the operator will flow test the well up to three days and then perform a pressure build up test that will last up to five days. This information is invaluable in determining the extent of the reservoir.

Depending on the geological issues, some of the wells in the Monument (mainly in the northern part – Sawtooth Mountain Gas Field) may need to be stimulated with an artificially induced fracture (well frac). In those cases the following pieces of equipment would be required to perform this work:

- Blender truck (a semi-type truck)
- Chemical van (lab and chemicals) (semi type truck)
- Data van (computer monitoring equipment) (similar sized truck to a wire line truck)
- Liquid pump truck (semi type truck)
- One to two nitrogen pump trucks (semi type trucks)
- Iron truck (semi-type truck carrying surface pipe supplies)
- Sand storage unit (semi-type truck)
- One 400 BBL water holding tank on location (transported via semi-type truck)
- One 250 BBL flowback tank (semi-type truck)
- Up to four 3/4-ton trucks for support

The frac operation typically takes less than a half day and on average the frac operation/post operation (flowback and well clean-up) lasts up to four days. The well is then put on line if the pipeline has been constructed.

Production Operations

Installation of production facilities generally requires little additional surface disturbance beyond that necessary for drilling and completion; however, additional disturbance could result from pipeline and gathering line installations if they are installed across undisturbed areas. If pipelines follow existing access roads, no appreciable additional surface disturbance is necessary to hook the well up to production. The typical equipment used for installing production equipment to a well includes the following:

- Pipe trailer transported via semi-type truck or poly pipe that is spooled off a coiled tubing reel trailer pulled by a 3/4-ton truck

- Excavator or a trenching piece of equipment brought into the site via a semi-type tractor trailer or a large goose neck trailer pulled by a 3/4-ton truck

Equipment that would stay with the well during its life includes the following:

- Well head, a gas meter house which is usually a 10-by-10-by-8 feet skid-mounted steel shed

- Pumpjacks which are sometimes used if water is produced with the gas, and the gas reservoir pressure declines to a level that is not adequate to overcome the hydrostatic pressure created by a column of water in the well. Pumpjacks are usually 8 to 10 feet in height, require a slightly larger surface area than a gas shack, and may or may not be skid-mounted. They are powered by either electric motors or natural gas/propane internal combustion engines.

The gas meter house and/or pumpjack are usually situated over the well head on the same area where the drill rig was set up. The installation of the pipeline and the meter house can last up to two days.

If liquid hydrocarbons (condensates) are produced with the gas, a separator and storage facility are necessary. Gas wells which produce water require a disposal pit for evaporation or to catch the water and later be hauled away by truck. A barrel of glycol is necessary to treat the water in the gas stream which prevents freeze-ups and removes water. The pit generally fits within the boundaries of the drilling pad and the final disturbed area necessary for production operations. After the production facilities are fully installed, the remaining drilling disturbances are reclaimed back to an area 100-by-100 feet. Liquid hydrocarbon storage at each well site is typically not required for the wells in the study area because the gas in this region normally does not yield liquid hydrocarbon.

Typically, the wells in the Monument are "sweet gas" wells, that is, they contain no hydrogen sulfide gas (H2S); therefore, no H2S facilities would be necessary for producing gas in the Monument. As the wells produce in an area, pressures eventually become depleted and they require an artificial method to lower the pressure of the gathering system to allow production to continue. Once this occurs, the operator will design and install a compressor station that further enables the production of natural gas from the wells. Currently, no compressor stations reside in the Monument and the closest compressor station to the Monument is located approximately four miles to the northwest. One compressor has been proposed and approved to be located within 1/2 mile of the Monument on a private well (the compressor has not been installed as of this document).

During the production phase, BLM monitors and approves field activities needed for well and field operations. Many operations, such as plugging, completion in a different zone, deepening, etc., require prior approval. Others, such as acidizing and fracturing, do not require prior approval but a subsequent report of operations describing the operation in detail must be filed.

Plugging and Abandonment of Wells

The purpose of plugging and abandoning a well is to prevent fluid migration between zones, protect minerals from damage, and restore the surface area. Each well must be handled individually due to a combination of factors, including geology, subsurface well design, and specific rehabilitation concerns. Therefore, only minimum requirements can be established, and these must be modified for individual wells.

The first step in the plugging process is filing a Notice of Intent to Abandon with the BLM. The notice must be filed and approved prior to plugging a past producing well. Verbal plugging instructions can be given for plugging current drilling operations, but a notice must be filed after the work is completed. If usable fresh water was encountered while the well was being drilled, the BLM may, if interested, assume future responsibility for the well and the operator will be reimbursed for the attendant costs. This assumption of responsibility becomes effective after the deeper zones are plugged back to the usable water zone. Usually, the operator is more than satisfied to remove the surface reclamation liability and will not charge for the remaining well equipment.

The operator's plan for securing the hole is reviewed. The minimum requirements as stated in Onshore Order No. 2, are as follows: In open hole situations, cement plugs must extend at least 50 feet above and below zones that have fluid with the potential to migrate, zones of lost circulation (this type of zone may require an alternate method to isolate it), and zones of potentially valuable minerals. Thick zones may be isolated using cement plugs across the top and bottom of the zone. In the absence of productive zones and minerals, long sections of open hole may be plugged with cement plugs placed every 3,000 feet. In cased holes, cement plugs must be placed opposite perforations and extending 50 feet above and below except where limited by plug back depth. The length of the plug is 100 feet plus 10 percent per 1,000 feet (i.e., at 10,000 feet the plug will be 200 feet long). Typical wells in the Monument range between 1,500 and 2,200 feet in depth.

Cement plugs could be replaced with a cement retainer, if the retainer is set 50 feet above the open perforations and the perforations are squeezed with cement. A bridge plug may also be used to isolate a producing zone and must be capped, if placed through tubing, with a minimum of 50 feet of cement. If the cap is placed using a dump bailer, a minimum of 35 feet of cement is required. A dump bailer is an apparatus run on wire line to convey the cement to the bottom of the hole. In the event that the casing has been cut and recovered, a plug is placed 50 feet within the casing stub, and the 100 feet plus 10 percent per 1,000 feet rule is used for the space above the cutoff point. In all cases, a plug is set at the bottom of the surface casing that has a volume of cement using the 100 feet plus 10 percent per 1,000 feet rule. This may require perforating the casing and circulating or squeezing cement behind the production casing if that casing is not removed. Annular space at the surface will be plugged with 50 feet of cement using small-diameter tubing or by perforating and circulating cement.

If the integrity of a plug is questionable or the position is extremely vital, it can be tested with pressure or by tagging the plug with the tubing or drill string. Tagging the plug involves running pipe into the hole until the plug is encountered and placing a specified amount of weight on the plug to verify its placement and competency. The surface plug within the casing must be a minimum of 50 feet. The interval between plugs must be filled with mud that will balance the subsurface pressures. If this balance point is unknown, a minimum of nine pounds per gallon is specified. After the casing has been cut off below the ground level, any void at the top of the casing must be filled with cement. A metal plate is welded over the top of the casing with a weep hole in the plate and the well identity and location permanently inscribed.

Typical equipment associated with plugging operations include a well workover/pulling unit, cement bulk truck, cement pump truck, water hauling truck (all semi-type trucks) and two to three, 1/2 to 3/4-ton pickup trucks. Depending on the depth of the well, the plugging operation can last up to three days. Typical plugging operations in the Monument last for one to two days.

Disturbance from plugging operations is usually contained within the existing disturbed area used to drill or produce the well, whichever the case may be. If the well to be plugged is a depleted producer, it is customary that the operator will dig a small catch pit (10 feet long by 10 feet wide by 8 feet deep) to contain any fluids pumped in and out of the well. Typical fluids that may come out of the well and put into the catch pit are formation water, drilling mud and cement. These fluid materials are removed from the pit within 48 hours of the well being plugged. Within a week of plugging the well, initial reclamation (dirt work) begins depending on the time of year the well is plugged.

The BLM is responsible for establishing and approving methods for surface reclamation and determining when this reclamation has been satisfactorily accomplished. When that determination is made a Subsequent Report of Abandonment is approved and the well bond is released.

Existing Oil and Gas Infrastructure

With the exception of county roads in the Monument (e.g., Cow Island Road) an estimated 13.0 miles of access roads (6.1 miles of right-of-way access) service the existing 14 gas wells (federal, state and private) within the Monument and an estimated 9.8 miles of access roads (4.2 miles of right-of-way (ROW) access) service 19 gas wells (federal, state and private) within 1/2 mile of the Monument. Many of the access roads are resource roads (two-track type roads) that allow well service vehicles and company personnel to visit the wells and facilities on a scheduled basis. The resource roads are not all-weather type surfaces so operators would use their best judgment to determine when the roads are passable. Many of the roads that access gas wells are also currently open for public use.

Of the 14 wells in the Monument, pipelines service 10 federal and one state well (three wells do not have pipeline service). The estimated length of pipelines in the Monument supporting the 11 wells is 31.1 miles (25.8 miles are covered by ROWs). Pipelines also service the 18 peripheral wells within 1/2 mile of the Monument (one well does not have pipeline service). The estimated length of pipe supporting the 18 peripheral wells is 21.1 miles (13.1 miles are covered by ROWs). An estimated 1/4 of the total pipeline length follows access roads; the remaining 3/4 does not. The total length of pipelines discussed above is 52.2 miles of pipeline and is best described by separating the pipelines into 10 separate sections. Table O.3-11 describes the pipelines in the study area.

Table O.3-11
Pipelines in the Study Area

Pipeline Section	*Well(s) PL Services*	*Legal Location*	*Pipeline Length*	*Remarks*
Butch Camp	Fed No. 1-7*	Sec 7, T25N R21E to Sec 3, T25N R20E	4.8 miles (4.6 miles of ROW)	4" poly pipe
Robinson/N. Bullwhacker	Fed No 1-12* Fed No 15-1 David Kincaid No 1 Fed No 31-3* State No 1 Fed No 34-1	Sec 12, T24N R21E, Sec 15, T24N R20E, Sec 3, T25N R20E, Sec 3, T25N R20E, Sec 16, T25N R20E Sec 34, T26N R20E, Leaving the Monument in Sec 4, T25N R20E	12.9 miles (9.1 miles of ROW)	2" steel and 4" poly pipe
W. Bullwhacker[1]			5.1 miles (4.5 miles of ROW)	
W. Coal Ridge	Fed No 35-24-18A* Fed No. 35-24	Sec 35, T24N R18E, Sec 35, T24N R18E, leaving the Monument in Sec 35, T24N R18E	1.3 mile (0.3 miles of ROW)	
Sherard "E" PA	US 4-27*[2] US 6-28* US 28-1*	Sec 27, T25N R19E, Sec 28, T25N R19E, Sec 28, T25N R19E, leaving the Monument in Secs 27 & 28, T25N	2.5 miles (1.6 miles of ROW)	

Table O.3-11
Pipelines in the Study Area

Pipeline Section	*Well(s) PL Services*	*Legal Location*	*Pipeline Length*	*Remarks*
		R19E		
Southeast Leroy[3]	Fed No P21-23-19N Fed No N27-23-19B Fed No A28-23-19N Fed No 31-23-19 Osburnsen 29-23-19	Sec 21, T23N R19E, Sec 27, T23N R19E, Sec 28, T23N R19E, Sec 31, T23N R19E, Sec 29, T23N R19E, Sec 22, T23N R19E, leaving the Monument in Sec 14, T23N R18E	12.5 miles (8.4 miles of ROW)	Pipeline crosses the Missouri River
Johnson/Ervin Ridge	Fed 29-15*	Sec 29, T24N R20E, leaving the Monument in Sec 15, T24N R19E	8.5 miles (8.0 miles of ROW)	Pipeline mainly buried in the access road
Sherard/Northwest Leroy	Fed 11-25-19 US 29-10 34-15 State 36-26-19	Sec 11, T25N R19E, Sec 29, T25N R19E, Sec 34, T26N R19E, Sec 36, T25N R19E, Leaving the study area in Sec 11, T25N R19E, Sec 29, T25N R19E and Sec 34, T26N R19E	3.5 miles (2.1 miles of ROW)	
North Leroy	Fed 23-26-20 Fed 21X-26	Sec 23, T26N R20E, Sec 26, T26N R20E, leaving the study area in Secs 23 & 26, T26N R20E	0.4 miles (0.0 miles of ROW)	
Sawtooth	Fed 1-2 US 9-9 Fed 15-9	Sec 2, T26N R20E, Sec 9, T26N R20E, Sec 9, T26N R20E, Leaving the study area in Secs 2 & 4, T26N R20E	0.7 miles (0.0 miles of ROW)	
Total	27 wells		52.2 miles (38.8 miles of ROW)	

* Monument well (8 wells). Another 19 wells are outside the Monument but are serviced by the overall natural gas pipeline system in the area.

1 Fed No 31-25-20 was plugged and abandoned on October 26, 2005. The referenced pipeline was allowed to remain in place because the BLM has an APD to be drilled in the vicinity of this pipeline/well that was plugged and abandoned.

2 A notice of intent to plug and abandon the US 4-27 well has been approved and the well likely will be plugged during the 2007 field season (spring or summer).

3 Fed L22-23-19N was plugged and abandoned on June 14, 2006.

The infrastructure related to natural gas surface operations, other than the access roads and pipelines, includes the following:

- Meter shed (8 feet long x 8 feet tall x 5 feet wide)
- Well head (can be enclosed within the meter shed depending on the operation)
- Gas meter run (enclosed within the meter shed)
- Glycol barrel (can be enclosed within the meter shed)
- Small water separator (normally enclosed within the meter shed depending on the well and the operation)
- Water pit sized depending on the operation, but can range from 20 feet x 20 feet x 8 feet to 40 feet x 40 feet x 10 feet)
- Gas compressor (Compressors typically do not accompany each well. Depending on the operation and the size of the compressor, one gas compressor could service 8-12 wells). Currently, no gas compressors are located within the study area; however, a skid-mounted 42 HP compressor has been approved by the State of Montana on the David Kincaid No. 1 private well (the compressor has not been installed as of this document).

Reasonable Foreseeable Development Baseline Scenario Assumptions and Discussion

The study area is being addressed because of the potential for future exploration and development on lands with existing federal leases. All federal lands in the study area are considered to have moderate and high potential for oil and gas occurrence. Occurrence is based on structural geology and historic activity of the area. It is further confirmed using well information to identify the extents of reservoirs. The areas considered to have high potential are those lands in the 18 exploration/production areas where commercial volumes and moderate shows of natural gas were evident at the time of well completion (Figures O.3-4 and O.3-5). All other federal lands in the study area are considered to have moderate potential for oil and gas occurrence.

In conjunction with these proposed actions, a review was conducted to evaluate the geologic potential of the study area and determine the Reasonable Foreseeable Development (RFD) that could be expected. A total of 11 exploration/production areas were identified with RFD well projections, as shown in Table O.3-12.

Specific well locations are not identified because many wells are considered proprietary information.

In addition to the 15.9 miles of existing roads supporting natural gas operations, the RFD locations would require 34.1 miles of new roads both in the Monument and within 1/2 mile of the Monument.

In addition to the 52.2 miles of existing pipeline, assuming a 35% success rate and because pipelines will be mostly buried in the access road corridor, the length of road to each new well was used. The new miles of pipelines are estimated at 11.9 miles. As a result, the number of well site visits can be limited to only those necessary for routine maintenance as determined via remote well monitoring with radio telemetry.

Proposed Actions

The BLM has received APDs from three federal lease holders in the study area in Blaine County, Montana.

One APD has been received from Klabzuba Oil and Gas, Inc., one from Macum Energy, Inc., and one from Devon Energy. All three are pending approval based on the outcome of the Monument RMP/EIS. The three wells would be drilled from the following locations:

- Klabzuba Federal 31-25-20B
  SE¼NW¼ of Section 31, T. 25 N., R. 20 E.
- Macum Federal 23-10
  NE¼SW¼ of Section 10, T. 25 N., R. 20 E.
- Devon Federal 9-7
  SW¼NE¼ of Section 9, T. 26 N., R. 20 E.

The wells would develop known gas resources in three producing gas fields in the study area. The wells would not require the construction of any new roads. If the wells are productive, they would require the installation of 3.7 miles of new pipeline in the study area to connect into existing pipelines.

Table O.3-12
RFD Well Projections

Exploration/Production Area	*Wells within 1/2 Mile of the Monument*	*Monument Wells*	*Total Wells*
North Leroy	4	1	5
Central Leroy	0	6	6
Central Leroy East	0	3	3
Leroy Bullwacker East	0	6	6
Sherard Northwest Leroy	7	8	15
West Leroy	1	0	1
South Sawtooth	13	4	17
Sherard Unit Area East	2	8	10
Southeast Leroy	1	1	2
Chase Hill	0	2	2
Sherard Unit	1	5	6
Total Wells in the 11 Areas	29	44	73

APPENDIX P
Wild and Scenic River Eligibility and Suitability Report

Introduction

The Wild and Scenic Rivers Act (Act), (Pub. L. 90-542 as amended; 16 U.S.C. 1271-1287) established a method for providing federal protection for certain of our country's remaining free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations. Rivers are included in the National Wild and Scenic River System (NWSRS) so that they may benefit from the protective management and control of development for which the Act provides. The preamble of the Act states:

It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in freeflowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

The Bureau of Land Management (BLM) planning process for the Upper Missouri River Breaks National Monument involves conducting a wild and scenic river eligibility and suitability determination.

Section 5(d)(1) of the Act directs federal agencies to consider potential wild and scenic rivers in their land and water planning processes. To fulfill this requirement, the BLM inventories and evaluates rivers and streams when it develops a resource management plan (RMP) for BLM land in a specified area. The inventory is conducted during the data gathering stage of RMP development, and the study phase is done during the formulation of the Draft RMP and Final RMP.

The data collection was contracted to the University of Montana through the Cooperative Ecosystems Studies Unit (CESU) and conducted by R. Neil Moisey, Ph.D. and Hartwell Carson, Graduate Assistant. The BLM oversaw the study process with the objectives of delivering information on what outstanding remarkable values certain streams in the Monument might possess, and what factors do or do not make these streams suitable for management as wild and scenic rivers. This information was then used by the planning team to make the final determination as to what streams were eligible and suitable.

Eligibility

The inventory process identifies rivers in the planning area, which may include a river, stream, creek, run, kill, rill, or small lake. Those responsible for conducting the inventories are directed to consider a wide variety of internal and external sources to identify potentially eligible rivers. The goal is to avoid overlooking river segments which have potential for inclusion in the national system river system. Once rivers are identified, the BLM applies standard criteria to determine eligibility. To be eligible, a river segment must be free-flowing and possess at least one river-related value considered outstandingly remarkable.

The initial screening of streams in the Monument was completed by the BLM. This effort identified intermittent or perennial streams based on a state list of all streams. Those streams were then plotted on a topographic map of the Monument to determine which streams were not included in the initial list. Those missing streams were then added to the study list (Table P.1).

The eligibility analysis consists of an examination of the river's hydrology, including any man-made alterations, and an inventory of its natural, cultural, and recreational resources. Free-flowing refers to whether the river is flowing in natural condition without structural modification of the waterway; existence of minor structures is not an automatic ban. The determination that a river area contains ORVs is based on objective scientific analysis and research that is reviewed by an interdisciplinary planning team.

In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. Definitions of the words "unique" and "rare" indicate that such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary. Typically, a "region" is defined on the scale of an administrative unit, a portion of a state, or an appropriately scaled physiographic or hydrologic unit. While the spectrum of resources that may be considered is broad, all values should be directly river-related. That is, they should: be located in the river or on its immediate shore lands (generally within 1/4 mile on either side of the river); contribute substantially to the functioning of the river ecosystem; and/or owe their location or existence to the presence of the river.

Table P.1
Streams on the Study List

Stream Name	*Location of Mouth*	*Total Miles*	*Miles on BLM Land*	*% Flowing on BLM Land*	*Free-Flowing*	*Outstanding Remarkable Values*
Armells Creek	21N, 22E, S24	13	5.5	42%	No	No remarkable values.
Fargo Coulee	21N, 23E, S18	10	9	90%	Yes	Some geologic and scenic values but not remarkable.
Sourdough Creek	21N, 22E, S28	6	6	100%	Yes	Some geologic and scenic values but not remarkable.
Two Calf Creek	22N, 23E, S28	17	15	88%	Yes	May contain scenic values but is a typical stream in the Monument. No remarkable values.
Reed Coulee	22N, 22E, S19	8	8	100%	Yes	Some geologic and scenic values but not remarkable.
South Fork Two Calf Creek	22N, 22E, S34	8.5	5	59%	Yes	May contain scenic values but is a typical stream in the Monument. No remarkable values.
Woodhawk Creek	23N, 22E, S19	17	16	94%	Yes	Fairly similar to Two Calf Creek and South Fork of Two Calf Creek, but has great exposure of Judith Formation like Dog Creek. Also crossed by the Nez Perce. The Nez Perce Trail crosses many streams, which does not make this stream remarkable. The exposure of the Judith Formation is not as unique as Dog Creek. No remarkable values.
Road Coulee	23N, 18E, S33	4	4	100%	Yes	No remarkable values.
Dog Creek	22N, 18E, S20	6.1	3.45	57%	Yes	Continuous 6-mile stretch of geologic formation. Best exposure of Judith formation. 800 vertical feet of drop on exposed section. This allows for the best potential for invertebrate paleontology, because of the exposed rocks. Dinosaur bones have been found but the area has not been thoroughly inventoried. Three sites were excavated in the 1850s, and some commercial collection. Outstanding remarkable values; geologic and paleontology.
Judith River	23N, 16E, S26	14	0	0%	Yes	Yes[1].
Evers Coulee	22N, 16E, S15	10	1	10%	Yes	No remarkable values.
Big Sag Coulee	22N, 16E, S22	9	0	0%	Yes	No remarkable values.

[1] The Judith River was previously addressed in the Judith-Valley-Phillips RMP (BLM 1994a).

Table P.1
Streams on the Study List

Stream Name	*Location of Mouth*	*Total Miles*	*Miles on BLM Land*	*% Flowing on BLM Land*	*Free-Flowing*	*Outstanding Remarkable Values*
Mutton Coulee	22N, 16E, S27	5	4	80%	Yes	Has diatreme that cuts through site, but this type of igneous feature is common elsewhere such as Dark Butte. No remarkable values.
79 Coulee	22N, 16E, S34	3	0.5	17%	Yes	No remarkable values.
Arrow Creek	19N, 12E, S31	19	1.5	8%	Yes	No remarkable values.
Flat Creek	22N, 15E, S6	2	0.5	25%	Yes	High concentration of tipi rings. Ferruginous hawk nest but not significant or remarkable.
Fahlgren Coulee	23N, 15E, S6	1.5	1	67%	Yes	Some geologic and scenic values but not remarkable.
Deadman Coulee	22N, 15E, S18	0.5	0	0%	Yes	Some geologic and scenic values but not remarkable.
Woodcock Coulee	21N, 15E, S30	2	0.7	35%	Yes	Some geologic and scenic values but not remarkable.
Spring Coulee	21N, 15E, S31	2.5	1.5	60%	Yes	Some geologic and scenic values but not remarkable.
Coffee Creek	21N, 15E, S31	5	1	20%	Yes	No remarkable values.
Sheep Shed Coulee	23N, 14E, S10	1.5	1	67%	Yes	Some unique geologic formations but no remarkable values.
Mud Spring Coulee	24N, 13E, S22	4	3.8	95%	Yes	Shale outcroppings but no remarkable values.
McLeish Coulee	24N, 13E, S27	2	1.5	75%	Yes	No remarkable values.
Sherry Coulee	24N, 13E, S16	3	1.5	50%	Yes	No remarkable values.
Pugsley Coulee	24N, 13E, S3	1.5	1	67%	Yes	No remarkable values.
Coal Mine Coulee	25N, 13E, S33	2.5	2	80%	Yes	Homesteading area. Some cultural and historic values but not remarkable.
Rattlesnake Coulee	25N, 13E, S15	0.2	0	0%	Yes	Some cultural values but not remarkable.
Cow Creek	23N, 22E, S6	23	8.9	31%	Yes	Some scenic and paleo values and the Nez Perce Trail. Eagle exposure, which is rare exposure in bottom and upper drainage of stream. Outstanding remarkable values; historic.
Cabin Creek	24N, 22E, S20	10	8.5	85%	Yes	Within an ACEC, WSA, and some paleo values. Judith exposure. While a good

Table P.1 Streams on the Study List						
Stream Name	*Location of Mouth*	*Total Miles*	*Miles on BLM Land*	*% Flowing on BLM Land*	*Free-Flowing*	*Outstanding Remarkable Values*
						example of the Judith formation, it is not unique. No remarkable values.
S. Creek	24N, 22E, S18	6	6	100%	Yes	No remarkable values.
Hay Coulee	25N, 22E, S30	9	9	100%	Yes	On the edge of a WSA and some sage-grouse habitat but not remarkable.
Coal Mine Coulee	25N, 22E, S30	2	2	100%	Yes	Tributary to Cow Creek with no remarkable values.
Right Coulee	25N, 21E, S27	10	8.5	85%	Yes	Within an ACEC, some scenic values, and an historic cabin but no remarkable values.
Left Coulee	25N, 21E, S27	9	9	100%	Yes	Within an ACEC, some scenic values, and an historic cabin, but no remarkable values.
Middle Coulee	25N, 21E, S27	5	4.5	90%	Yes	Within an ACEC, some scenic values, and an historic cabin, but no remarkable values.
Davidson Coulee	25N, 21E, S5	6	4.5	75%	Yes	Some scenic and historic values but not remarkable.
Suction Creek	26N, 21E, S21	1.5	0	0%	Yes	Nez Perce Trail but not significant or remarkable.
Al's Creek	26N, 21E, S17	8.5	0.5	6%	Yes	Scenic values and sage-grouse habitat, but only above the study area. Not typical breaks topography. No remarkable values.
Bullwhacker Creek	24N, 21E, S34	26	25.3	97%	Yes	Scenic and riparian values. Sage-grouse is present in the area, but this is not an outstanding remarkable example of their habitat.
Little Bullwhacker	24N, 21E, S34	7	6	86%	Yes	Bighorn sheep habitat and the Cable place on upper section has some unique history but no remarkable values.
Lion Coulee	24N, 20E, S15	9	3	33%	Yes	Some riparian values but not remarkable.
N.F. Lion Coulee	25N, 19E, S34	1.5	1.5	100%	Yes	Some riparian values but not remarkable.
W.F. Bullwhacker	25N, 20E, S20	6	6	100%	Yes	Some sage-grouse habitat but not remarkable.
Christenson Branch	25N, 20E, S18	4.5	4.5	100%	Yes	No remarkable values.
Williamson Coulee	23N, 20E, S6	10	7	70%	Yes	Bighorn sheep habitat and scenic values. Deep coulee. Kimberlitic diatreme, but not significant, not a lot different from other streams. No remarkable values.

Table P.1 Streams on the Study List						
Stream Name	***Location of Mouth***	***Total Miles***	***Miles on BLM Land***	***% Flowing on BLM Land***	***Free-Flowing***	***Outstanding Remarkable Values***
Greasewood	23N, 20E, S2	7	4	56%	Yes	Bighorn sheep habitat and scenic values. Similar to Williamson Coulee. No remarkable values.
Coal Coulee	23N, 19E, S19	6	6	100%	Yes	Rough canyon with scenic values and mule deer habitat. Next to the Stafford Ferry. Rough access. Bighorn sheep. Not remarkable.
Birch Creek	23N, 17E, S20	3	0.5	17%	Yes	Bighorn sheep habitat and prairie dog towns but not remarkable.
Chip Creek	23N, 16E, S27	1.5	0	0%	Yes	No remarkable values.
Dry Lake Coulee	23N, 16E, S33	4	2	50%	Yes	Scenic values and historic sites. Raptor values but not outstandingly remarkable. Deep, sharp coulee. Much of the coulee is in WSA. Not remarkable.
Pablo	23N, 14E, S12	7	4.5	64%	Yes	Historic sites and below white rocks. No remarkable values.
Dark Butte	23N, 14E, S4	4	3	75%	Yes	Scenic values and historic sites but not remarkable.
Winter Camp Coulee	24N, 13E, S3	1.5	0	0%	Yes	No remarkable values.
Butcher Knife Coulee	24N, 13E, S3	2	1	50%	Yes	No remarkable values.
Eagle Creek	25N, 13E, S16	2.2	0	0%	Yes	Recreation, historic sites, and pictographs. Has Eagle formation rare geology. Lewis and Clark campsite at the mouth. Old post office. Recreation values for hiking, canyons, camping and Lewis and Clark activities. Most used recreation site in the Monument. Outstanding remarkable values; historic, recreation, and scenic.
Sheep Coulee	25N, 13E, S15	0.3	0	0%	Yes	No remarkable values.
Cut Bank Coulee	25N, 13E, S9	1.5	0	0%	Yes	Within the White Cliffs area and historic sites, but not remarkable.
Crooked Coulee	26N, 13E, S30	0.7	0	0%	Yes	Within the White Cliffs area and historic sites, but not remarkable.
Lone Tree Coulee	26N, 13E, S19	1	0.2	20%	Yes	Within the White Cliffs area and historic sites, but not remarkable.
Alkali Coulee	26N, 13E, S19	1	0	0%	Yes	Within the White Cliffs area and historic sites, but not remarkable.
Little Sandy Creek	26N, 12E, S12	4.5	0	0%	Yes	Recreation, easements, and cultural values. Eagle nest within 1/2 mile, close to 1/4 mile for designation (nest has

Table P.1 Streams on the Study List						
Stream Name	*Location of Mouth*	*Total Miles*	*Miles on BLM Land*	*% Flowing on BLM Land*	*Free-Flowing*	*Outstanding Remarkable Values*
						moved a lot) but not considered remarkable since eagles inhabit much of the area. Big broad channel used to be Missouri River channel before glacial period, but not remarkable because of the common role glaciers played in shaping the landscape of the Monument. Cultural site over 10,000 years old of tipi rings, but there are many tipi rings through the Monument.
Coal Banks Coulee	26N, 12E, S6	0.8	0.8	100%	Yes	Recreation and historic bridge, but no remarkable values.
Antelope Creek	22N, 23E, S21	13	8.5	65%	Yes	No remarkable values.
Bull Creek	23N, 22E, S6	11	10.5	95%	Yes	Unique landscape and writings on sandstone, but not considered unique or remarkable.
Lind Coulee	23N, 22E, S2	12	11	92%	Yes	Within a WSA and unique landscape. No remarkable values.

Outstandingly Remarkable Values (ORVs)

The following eligibility criteria are intended to set minimum thresholds to establish ORVs and are illustrative but not all-inclusive. The streams listed in Table P.1 were reviewed for free-flowing and ORVs.

Scenery: The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attractions. When analyzing scenic values, additional factors – such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed – may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.

Recreation: Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. Visitors are willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, fishing and boating.

Interpretive opportunities may be exceptional and attract, or have the potential to attract, visitors from outside the region of comparison.

The river may provide, or have the potential to provide, settings for national or regional usage or competitive events.

Geology: The stream, or the area within the stream corridor, contains one or more example of a geologic feature, process or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a "textbook" example, and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic structures).

Fish: Fish values may be judged on the relative merits of either fish populations, habitat, or a combination of these stream-related conditions.

Populations: The stream is nationally or regionally an important producer of resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."

Habitat: The stream provides exceptionally high quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of habitats is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."

Wildlife: Wildlife values may be judged on the relative merits of either terrestrial or aquatic wildlife populations or habitat or a combination of these conditions.

Populations: The stream, or area within the stream corridor, contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique, and/or populations of federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."

Habitat: The stream, or area within the stream corridor, provides exceptionally high quality habitat for wildlife of national or regional significance, and/or may provide unique habitat or a critical link in habitat conditions for federal or state listed (or candidate) threatened, endangered or sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."

Prehistory: The stream, or area within the stream corridor, contains a site(s) where there is evidence of occupation or use by American Indians. Sites must have unique or rare characteristics or exceptional human interest value(s). Sites may have national or regional importance for interpreting prehistory; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; and/or may have been used by cultural groups for rare sacred purposes. Many such sites are listed on the National Register of Historic Places, which is administered by the National Park Service.

History: The stream or area within the stream corridor contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region. Many such sites are listed on the National Register of Historic Places. A historic site(s) and/or features(s) is 50 years old or older in most cases.

Cultural: The stream or area within the stream corridor contains archaeological sites or areas significant to traditional cultures. Examples might be American Indian burial grounds, petroglyphs, the oldest known human use site in a region, or streams that support traditional agriculture, subsistence fishing, or religious ceremonies.

Other Values: While no specific national evaluation guidelines have been developed for the "other similar values" category, assessments of additional stream-related values consistent with the foregoing guidance may be developed including, but not limited to, hydrology, paleontology and botany resources.

Eligible Streams

The following three streams were found to be free-flowing and possess one or more outstandingly remarkable values.

Cow Creek

Stream Segment: 28.9 miles
Miles on BLM Land: 8.9

Historic Values: The Nez Perce were forced from their homeland in north central Idaho, southwestern Washington, and northeastern Oregon by expanding population of explorers, trappers, miners, and missionaries. This led to the first battle between the Nez Perce and settlers in 1877. Several more battles ensued as the U.S. Army chased at least 750 Nez Perce over 1,200 miles through Idaho, Wyoming, and Montana as the Nez Perce tried to escape to Canada. At the end of September the Nez Perce arrived in the Missouri River Breaks country, crossed the river at Cow Island, and established camp on Cow Creek a few miles upstream of the Missouri River. The Nez Perce were in need of supplies so after being denied their request for provisions at the Cow Island steamboat landing, the Nez Perce warriors forcefully ran off the attendants, took the supplies they needed, and burned the rest. This was the last battle before the U.S. Army caught the Nez Perce on September 30, and forced them to surrender. This surrender is marked by the famous speech of Chief Joseph when he said, "I will fight no more forever." The Nez Perce National Historic Trail was established in 1986. Cow Creek is a major landmark on this trail. The history in the area is extensive, but the Nez Perce Trail provides the only outstanding remarkable historic value.

Dog Creek

Stream Segment: 6.1 miles
Miles on BLM Land: 3.5

Geologic Values: Dog Creek contains the type locality described as the Judith River formation by F. V. Hayden, the first scientist to map the area, in 1853. The type section for a given formation is often named for surface features in the vicinity such as the Judith River. The formation was deposited during the late cretaceous period between 65 and 70 million years ago. The main channel of Dog Creek allows for an excellent opportunity to view the exposure of the Judith River

formation. It provides an opportunity for geology students and hobby rock collectors alike to become acquainted with the stratigraphy of the Judith River formation in the area.

Paleontology Values: The exposure of sandstone and coal layers provides an excellent potential for finding both vertebrate and invertebrate fossils. Dinosaur fossils have been discovered and collected from the area. The earliest collections were made in the 1850s, and supplied the museums of Europe with some of the first known specimens of Ceritopcian and Hadrasaur specimens. There are 23 different species of Pleisiosaur (a marine reptile) identified from the Judith River and overlying Bearpaw Shale formation. Commercial collectors, in recent times, have removed specimens from private land in the upper reaches of Dog Creek. Overall, the area has not been thoroughly inventoried, but it is believed to possess the best potential for future fossil finds.

Eagle Creek

River Segment:	2.2 miles
Miles on BLM Land:	0
BLM Use Easement	1.2 miles

Historic Values: Like a lot of areas in the Monument, there are many historic values on Eagle Creek from homesteads, pictographs, and an old post office, but the value that makes Eagle Creek outstandingly remarkable is the Lewis and Clark campsite. On May 31, 1805 Lewis and Clark stopped at the mouth of Eagle Creek and set up camp and saw the area very similar to the way it exists today. While camped they wrote one of their numerous journal entries about the romantic White Cliffs that dominate the Eagle Creek area. Although there are many Lewis and Clark campsites in the area, this is still very significant on a national level and has proven to attract visitors from all over the country.

Recreation Values: Eagle Creek provides the best opportunity for recreation in the Monument. The Missouri River attracts around 6,000 visitors a year to float sections of the river, with over 4,000 of those people visiting the White Cliffs stretch of the river. Eagle Creek is a major highlight along the 149-mile section frequented by floaters, and the first place most people camp in the White Cliffs section of the river. These factors along with the recreation opportunities listed below combine to make Eagle Creek the most frequented campsite along the Upper Missouri National Wild and Scenic River.

The Eagle Creek campsite has mature cottonwood trees that provide shade and make for an inviting campsite, while numerous trails to slot canyons, pictographs, and other scenic destinations provide plenty of recreation activities for campers. The Eagle Creek valley contains a nice hike that takes visitors up through the valley. A popular stop along this hike is the pictographs that feature a prehistoric drawing of a horse. Many visitors come to Eagle Creek to camp where Lewis and Clark camped and to see the White Cliffs in an almost identical form to how Lewis and Clark saw them 200 years ago. All of these factors combine for an overall outstanding recreation value.

Scenic Values: The Eagle Creek section of the Upper Missouri National Wild and Scenic River is generally regarded as one of the most scenic stretches of the river. The Missouri River is flanked on one side by 30-100 feet tall White Cliffs that appear as they did 200 years ago during the epic Lewis and Clark expedition. The north shore of the Missouri River is a wide valley with cottonwoods ringing the river and a backdrop composed of rolling hills and cliffs. The valley that Eagle Creek flows through is very similar to these features of the Missouri River. From the mouth of Eagle Creek the spectacular Missouri River White Cliffs are in view, and as one looks upstream more spectacular cliffs flank both sides of Eagle Creek. These cliffs provide landforms and adjacent scenery that greatly enhance visual quality. These features are rare to the region, increasing their scarcity value. Cottonwood groves are intermittent along the stream and grass, trees, flowers, cliffs, and water provide color and vegetation that increase the scenic quality of the stream. This stream was rated an A on the scenic quality field inventory from all four vantage points. These vantage points encompass the entire section of Eagle Creek.

Classification

After eligibility is determined the second step is "potential classification based on the condition of the river and the adjacent lands." Section 2(b) of the Act specifies three classification categories (wild, scenic, and/or recreational) for eligible rivers. Classifying a river as either wild, scenic and/or recreational provides a general administrative categorization tool for interim management. Once a river segment is determined eligible and the appropriate classification determined, it must be afforded adequate protection until a final decision is reached on suitability and designation. Final classification is a Congressional legislative determination along with designation of a river segment as part of the NWSRS.

Potential Classification

The Act and Interagency Guidelines provide the following direction for establishing preliminary classifications for eligible rivers:

Wild rivers (W): Those rivers or sections of rivers that are free of impoundments and generally inaccessible

except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic rivers (S): Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational rivers (R): Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Table P.2 lists the classification determinations for the eligible streams.

Rivers or river segments determined eligible must be managed to protect the free-flowing, outstandingly remarkable values, and tentative classification. This protective management is in place until a river or river segment is determined suitable or nonsuitable for recommendation. During this interim protection any proposed action which may adversely impact or be inconsistent with wild and scenic river values would require management decisions based on National Environmental Policy Act (NEPA) analysis and Section 202 of the Federal Land Policy and Management Act (FLPMA).

- Any proposed action which may be inconsistent with or adversely impact identified wild and scenic river (WSR) values would require a site-specific environmental assessment (EA), opportunity for public involvement, and at least a 30-day public comment period. The decision notice record for the EA (involving these types of actions) would be conducted and signed at the field office level. However, prior to signature a copy of supporting documentation would be forwarded to the State Director for review and concurrence.

- If the EA determined that the proposal could have a major action significantly affecting the environment, a separate environmental impact statement (EIS) apart from the BLM RMP/EIS would be required.

- Should the EA or EIS determine that the action as proposed, or with appropriate mitigation, or an acceptable alternative, would not have irreversible or irretrievable adverse impacts and would maintain or enhance identified WSR values, such action may be approved.

- If the EA or EIS determined that the action as proposed would have irreversible or irretrievable adverse impacts to identified WSR values, the decision on the action would be held temporarily in suspension until WSR evaluations are addressed and resolved through the BLM planning process.

Suitability

Once river segments have been evaluated and determined eligible for further study, agencies conduct an evaluation to determine if the segments are "suitable" or "nonsuitable" for WSR designation within their resource management planning processes (Section 5(d)(1)). In this process, river values and their potential for designation are analyzed along with other resource values, issues and alternatives.

Suitability represents an assessment or determination as to whether or not eligible river segments should be recommended for inclusion in the NWSRS by Congress. Characteristics which do or do not make the area a worthy addition to the NWSRS are described.

Table P.2
Classification Determinations for Eligible Streams

Stream	*Classification*	*Reason*
Cow Creek	Wild	Cow Creek is surrounded by the largest tracts of BLM land, and is generally considered the most wild and primitive area of the Monument. Access is more difficult into this area. There are some primitive public roads that can reach certain segments of the stream.
Dog Creek	Scenic	There are some major roads in the area, but these are all constrained to the Judith River valley area. Dog Creek is largely primitive and undeveloped. There are a few small structures, including a windmill and fence running through part of stream and valley. There is evidence of livestock grazing.
Eagle Creek	Scenic	The road that leads down from the Darlington ranch provides the only access other than Missouri River access. There is some evidence of human activity. A 4-wheeler trail runs up the valley and crosses the river at numerous points. There is a small amount of evidence of livestock grazing.

Cow Creek

The Nez Perce National Historic Trail is the highlight of this area's history, but the history is diverse. Archaeological studies indicate as far back as 6,000 years ago prehistoric people were using the flat valley of Cow Creek. Diverse arrays of homesteads were once common in the area. Cow Island served as the farthest upriver port during low water years (Monahan and Biggs 2001).

1. **The current status of land ownership, minerals (surface and subsurface), use in the area, including the amount of private land involved and associated or incompatible uses. Jurisdictional consideration must be taken into account to the extent that management would be affected.**

28.9 miles total
08.9 miles BLM
20.0 miles private
31% on BLM

Although a majority of the stream miles are on private land, most of the land in the area is BLM. The private land includes the valley of Cow Creek. There are no oil and gas leases on Cow Creek but there is one lease adjacent to this area. This area has a low potential for development.

The BLM land along this segment is available for livestock grazing. Private land in the area is primarily used for livestock grazing and farming.

2. **The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed or curtailed if the area were included in the NWSRS, and the values which could be foreclosed or diminished if the area is not protected as part of the NWSRS.**

There is potential that a portion of the private land could be developed for home/recreational residences. There is some small farm fields (<400 acres) on private land along Cow Creek in the northern part of the area. There are some small acreages that could be developed for agricultural crops; however, it is unlikely they would be developed.

An existing reservoir in the upper watershed of Cow Creek impounds the main channel and could manipulate the flow rate in the stream. However, because of the nature of the reservoir, the volume of water and stream characteristics it does not appear likely to ever sustain a perennial stream.

It is unlikely that further dams/reservoirs would be constructed on private land to further impound water in Cow Creek proper. Construction of small reservoirs and pits on tributary drainages is possible on BLM or private land further limiting water flowing into Cow Creek.

Direct recreational use of water (fishing, floating, etc.) is not a feature of the area or Cow Creek and is unlikely in the future.

3. **The federal agency or state agency that will administer the river and/or area should it be added to the NWSRS.**

Bureau of Land Management

4. **Federal, state, local, tribal, or other interests in the designation or nondesignation of the river, including the extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state, local, or other agencies and individuals.**

County government has indicated they are opposed to the designation of Cow Creek as a WSR.

The National Park Service may be interested in participating to the extent of recognition of the Nez Perce National Historic Trail, but beyond that it is unlikely.

Fort Belknap (Gros Ventre and Assiniboine) makes claims west of the reservation as far as and including Cow Creek, but these claims have not been affirmed.

The airspace over Cow Creek is in the Hays Military Operations Area (MOA). This is a designated airspace for military aircraft training. The Department of Defense and, specifically, the Montana Air National Guard may have concerns about the designation of Cow Creek as a WSR.

5. **The estimated cost to the United States of acquiring necessary lands and interest in lands and of administering the area should it be added to the NWSRS.**

About 3,200 acres of private land would be included within the boundary of Cow Creek if it were designated a Wild and Scenic River. Costs of acquisition with regard to Cow Creek are based on the average value of agricultural land at $100/acre, as well as recent appraisals of Missouri River frontage with recreational home sites considered the highest and best use and valued at $1,850/acre. Using those same values, the Cow Creek lands could range in value from $320,000 to $5,920,000. Acquisition would only be accomplished with willing sellers and it is unlikely that private land holders would be willing to sell the land. Costs of administration would be minimal.

6. **A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.**

It is not anticipated that the state or local governments would participate.

7. **The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river-related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on non-federal lands.**

The Cow Creek Area of Critical Environmental Concern (ACEC) includes the lower reaches of Cow Creek on BLM land. Designation as an ACEC was made to protect portions of the Nez Perce and Lewis and Clark National Historic Trails, high scenic quality and paleontological resources.

The Cow Creek Wilderness Study Area (WSA) is on the east side of the lower reaches of Cow Creek.

The Upper Missouri National Wild and Scenic River includes the mouth of Cow Creek. This section of the river is designated "Wild."

The Hays Military Operations airspace over Cow Creek is commonly used for military aircraft training.

8. **An evaluation of the adequacy of local zoning and other land use controls in protecting the river's ORVs by preventing incompatible development.**

Blaine County does not have any zoning limitations on Cow Creek.

The federal minerals are closed to new leasing. Gas leases maybe possible on private minerals; however, past explorations were unsuccessful.

9. **Support or opposition to designation.**

There is general opposition by local governmental interests, believing that the designations currently in place are more than enough for adequate protection. Also the character of the area is not that of a "river." Local support is unlikely. No known other interest.

10. **Historical or existing rights which could be adversely affected.**

There are water claims on Cow Creek for various uses along its entire length. It does not appear that there is a reserve water right on the creek to maintain a minimum flow. There are active grazing permits for the BLM land and grazing is the historic use of the private land along Cow Creek.

11. **The consistency of designation with other agency plans, programs or policies and in meeting regional objectives.**

Designation would effectively be redundant of current designations.

Other agency plans do not assert management on Cow Creek. Water rights through the Montana Department of Natural Resources and Conservation will adjudicate claims for water in Cow Creek at some time in the future.

12. **The contribution to river system or basin integrity.**

Cow Creek does flow into the Missouri River, which is designated a WSR. However, the headwaters of Cow Creek and its tributaries are mostly private land. Only the lower reaches of Cow Creek have significant amounts of BLM land and even in this area, the channel of Cow Creek is mostly private land. Water available in the headwaters is being used for irrigation and other uses. Though the upper reaches of Cow Creek are mostly perennial, the lower reaches of Cow creek are ephemeral. From a practical standpoint it is not likely that a total system management strategy can be pursued with a focus on the total watershed.

13. **The potential for water resources development.**

There is currently one mainstream reservoir on Cow Creek near the headwaters that impounds water for irrigation and recreation. This reservoir is on private land. It is unlikely that further water impoundments would be installed on Cow Creek. It is unlikely flood control, hydropower facilities, dredging or diversions or channelization of Cow Creek will occur.

Recommendation: This segment of Cow Creek is not suitable for designation because of the lack of BLM land ownership, the area is included in the UMNSWR or Cow Creek ACEC, and management of the area already provides protection for the values along this segment of Cow Creek.

Dog Creek

The geologic and paleontology values are the creek's primary value, but the creek does possess the potential for excellent recreation opportunities. There is no public access to Dog Creek.

1. **The current status of land ownership, minerals (surface and subsurface), use in the area,**

including the amount of private land involved and associated or incompatible uses. Jurisdictional consideration must be taken into account to the extent that management would be affected.

6.10 miles total
3.45 miles BLM
2.65 miles private
57% on BLM

The creek has grazing and evidence of grazing, including fencing. The area has a low to moderate potential for oil and gas, and no federal mineral leases. There are some leases that straddle Dog Creek outside of the monument, but again a low to moderate potential of these being developed for natural gas.

2. **The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed or curtailed if the area were included in the NWSRS, and the values which could be foreclosed or diminished if the area is not protected as part of the NWSRS.**

No foreseeable changes or values diminished.

3. **The federal agency or state agency that will administer the river and/or area should it be added to the NWSRS.**

Bureau of Land Management.

4. **Federal, state, local, tribal, or other interests in the designation or nondesignation of the river, including the extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state, local, or other agencies and individuals.**

State and local governments have indicated they are not interested in management of Dog Creek as a WSR. No other known interest.

5. **The estimated cost to the United States of acquiring necessary lands and interest in lands and of administering the area should it be added to the NWSRS.**

About 424 acres of private land would be included within the boundary of Dog Creek if it were designated a Wild and Scenic River. That figure is based on the following formula: 2.65 miles of private x 5,280 ft/mile x 1,320 ft (.25 miles) divided by 43,560 (square ft/acre). Costs of acquisition with regard to Dog Creek are based on the average value of agricultural land or $100/acre, as well as recent appraisals of Missouri River frontage with recreational homesites considered the highest and best use and valued at $1,850/acre. Using those same values, the Dog Creek lands could range in value from $42,400 to $784,400. Acquisition would only be accomplished with willing sellers and it is unlikely that private land holders would be willing to sell the land. Costs of administration would be minimal.

6. **A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.**

It is not anticipated that the state or local governments would participate.

7. **The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river-related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on non-federal lands.**

One mile of the creek is within the Dog Creek WSA. Public access is from the Missouri River; there is no public road access.

The Upper Missouri National Wild and Scenic River includes the mouth of Dog Creek. This segment of the river is designated "Wild."

8. **An evaluation of the adequacy of local zoning and other land use controls in protecting the river's ORVs by preventing incompatible development.**

No local zoning.

9. **Support or opposition to designation.**

State and local government are opposed to designation and local support is unlikely. No other known interest.

10. **Historical or existing rights which could be adversely affected.**

None.

11. **The consistency of designation with other agency plans, programs or policies and in meeting regional objectives.**

Consistent with management plan of the UMNSWR.

12. **The contribution to river system or basin integrity.**

Limited contribution.

13. **The potential for water resources development.**

Not enough year-round flow to lead to water development.

Recommendation: The BLM has determined that this segment of Dog Creek is not suitable for designation because of the lack of continuous BLM land ownership, the area is included in the UMNSWR and Dog Creek WSA, and management of the area already provides protection for the values along this segment of Dog Creek.

Eagle Creek

Eagle Creek is eligible for historic, recreation, and scenic values. These values are the most important characteristics of Eagle Creek. Several homesteaders were in the area, and even a post office that lasted for 15 months. Eagle Creek played a role in the history of the steamboat era. One steamboat burned in the Missouri right off Eagle Creek and the USS Mandan crew spent the winter in the Eagle Creek area after ice locked the boat in for the season (Monahan and Biggs, 2001). Access to Eagle Creek is provided at its mouth with the Missouri River. This is the only access, but with only 2.2 miles within the Monument, it is an easy walk to explore this entire valley.

1. **The current status of land ownership, minerals (surface and subsurface), use in the area, including the amount of private land involved and associated or incompatible uses. Jurisdictional consideration must be taken into account to the extent that management would be affected.**

2.2 miles total
1.2 miles private (BLM easement)
1.0 miles state
0% BLM
55% private (BLM easement)
45% state

Although Eagle Creek and the campsite are not part of the BLM's land holdings, 1 mile of the creek is state land and the rest of the creek is accessible to the public, since a BLM use easement covers the channel of Eagle Creek. Eagle Creek has no federal oil and leases and the area has a very low potential for future development. The state land could be developed for oil and gas, but it is unlikely because of the low potential for natural gas.

2. **The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed or curtailed if the area were included in the NWSRS, and the values which could be foreclosed or diminished if the area is not protected as part of the NWSRS.**

This area will continue to have concentrated recreation use, which will likely increase in the future. The area will continue to be used for livestock grazing.

3. **The federal agency or state agency that will administer the river and/or area should it be added to the NWSRS.**

Since the area does not include BLM land, the state would be the likely agency to administer the area. However, the state is not interested in management of the area as a WSR.

4. **Federal, state, local, tribal, or other interests in the designation or nondesignation of the river, including the extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state, local, or other agencies and individuals.**

State and local governments have indicated they are not interested in management of Eagle Creek as a WSR. The airspace over Eagle Creek is in the Hays Military Operations Area (MOA). This is a designated airspace for military aircraft training. The Department of Defense and, specifically, the Montana Air National Guard may have concerns about the designation of Eagle Creek as a WSR.

5. **The estimated cost to the United States of acquiring necessary lands and interest in lands and of administering the area should it be added to the NWSRS.**

The BLM has a use easement for management of the campground and a conservation easement for land surrounding the campground (to prevent development). The easements are tied to the Upper Missouri National Wild and Scenic River designation. Eagle Creek is within this current designation. About 192 acres of private land would be included within the boundary of Eagle Creek as a designated Wild and Scenic River. That figure is based on the following formula: 1.2 miles of private x 5,280 ft/mile x 1,320 ft (.25 miles) divided by 43,560 (square ft/acre). Costs of acquisition with regard to Eagle Creek are based on recent appraisals of Missouri River frontage valued at $1,850/acre. Using that same value, the Eagle Creek land would be valued at $355,200, more or less. Acquisition would only be accomplished with willing sellers and it is unlikely that private land holders would be willing to sell the land. Costs of administration would be minimal.

6. **A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.**

It is not anticipated that the state or local governments would participate.

7. The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river-related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on non-federal lands.

The BLM currently has a conservation easement for land surrounding the campground in this area (to prevent development).

The Upper Missouri National Wild and Scenic River includes the mouth of Eagle Creek. This section of the river is designated "Wild."

The Hays Military Operations airspace over Eagle Creek is commonly used for military aircraft training.

8. An evaluation of the adequacy of local zoning and other land use controls in protecting the river's ORVs by preventing incompatible development.

Chouteau County zoning regulations. The BLM currently has a conservation easement for land surrounding the campground in this area (to prevent development).

9. Support or opposition to designation.

There is general opposition by local governmental interests. The current designations in place are more than enough for adequate protection of the area. Local support is unlikely.

10. Historical or existing rights which could be adversely affected.

None.

11. The consistency of designation with other agency plans, programs or policies and in meeting regional objectives.

Designation may impede BLM goals for managing the Monument and the ability to achieve cooperation with local landowners. Designation would be effectively redundant of the current designations (Monument and UMNWSR).

12. The contribution to river system or basin integrity.

Not a contribution to the river system. Eagle Creek does flow into the Missouri River, which is designated a WSR. All of the eligible stream is on private land. From a practical standpoint it is not likely that a total system management strategy can be pursued with a focus on the total watershed.

13. The potential for water resources development.

The flows in Eagle Creek are low except for the spring runoff. The potential for water resource development is low. It is unlikely flood control, hydropower facilities, dredging or diversions or channelization of Eagle Creek will occur.

Recommendation: This segment of Eagle Creek is not suitable for designation because of the lack of BLM land ownership, the area is included in the UMNSWR, and management of the existing easements provide protection for the values along this segment of Eagle Creek.

APPENDIX Q
Visitor Use Standards and Indicators

Alternatives C and F (Preferred Alternative)

Topic: Opportunities for Boaters

Indicators, Desired Future Conditions, Standards and Actions to manage visitor use opportunities within Limits of Acceptable Change without invoking a permit system or allocation of use.

Indicator 1. Sight and sound levels that create opportunities for privacy, solitude, and a primitive boating and camping experience.

Desired Future Condition

Maintain use opportunities without constraint of a permit system (other than a self-registration permit) and allocation of visitor use. Visitors will have the opportunity to periodically experience moments of solitude on some portion of their trip. Visitors will have the opportunity to camp in primitive sites that reflect natural qualities of the river environment.

Standard

Two occurrences of 170 people launching per day (based on a running 3-day average) from a total of all sites located between the Chouteau County Fairgrounds Campground and Canoe Launch, and Coal Banks Landing.

Three occurrences of 100 people launching per day (based on a running 3-day average) from a total of all sites located between Judith Landing and the James Kipp Recreation Area.

Monitoring

Analysis of boater registration data.

Management Actions

The following is a list of actions managers could select from as needed to maintain the sight and sound standard. Other actions may be developed as needed to adapt to changes in visitor use patterns.

- Create a web-based mandatory registration system that would provide information to potential boaters regarding high use launch days. This would allow boaters the option of selecting dates outside of busy timeframes.
- Encourage boaters to stagger launches at the put-in (don't launch until the group in front of you is out of sight and sound) and when leaving camp on subsequent days.
- Encourage groups of boaters to stay in a compact flotilla. Discourage boaters from spreading out with wide distances between boats in the same party.
- From June 15 to August 1, require groups larger than 20 people camping between Coal Banks Landing and Judith Landing to camp only in Level 2 sites, and begin to identify Level 4 camping opportunities on the floater maps.
- From June 15 to August 1 limit all groups to a one-night stay at any Level 2, 3 or 4 site between Coal Banks Landing and the James Kipp Recreation Area.
- Pursue purchase or lease of sites to develop additional Level 2 or 3 camping opportunities.
- Develop additional Level 3 primitive boat camps on existing public land.
- Construct additional Level 2 sites in areas where visual integrity could be maintained.
- Require groups of 20 people or larger to acquire an SRP with stipulations on date they can launch and where they can camp.
- Develop and implement a group size limit of 20 people. If this group size limit does not effectively reduce impacts then smaller group size limits may be considered.

Indicator 2. The condition class of Level 2, 3 and 4 sites (excellent, good, fair, poor).

Desired Future Condition

The Upper Missouri River will have a diverse set of camping and visitor opportunities and there will be fair access to campsites among all types of users. Campsites along the river will reflect natural qualities and have minimal congestion. A range of camping opportunities will be present throughout the river corridor.

Standard

All Level 2, 3, and 4 sites will be in fair or better condition.

Monitoring

Measure the disturbance to individual campsites. Campsite monitoring will take place in August and September. Level 3 and 4 sites in designated wild and scenic sections will be monitored each year. Level 3 and 4 sites in designated recreation sections will be monitored every 2 years. Level 2 sites in any designated section will be monitored every 2 years.

Management Actions

As needed to maintain class standard:

- Aggressively promote Leave No Trace standards and use of existing sites.
- Promote use of Level 2 sites (concentrate use).
- Modify current Level 2 sites to provide for screening and privacy and provide surface hardening in areas of high use (fire rings, restrooms, social trails).
- Rest and rotate individual sites.
- Close and rehabilitate individual sites.
- Purchase short-term leases from private landowners to create additional Level 3 and 4 opportunities.
- Develop additional Level 3 and 4 sites on existing public land.

Indicator 3. River corridor riparian health assessment score.

Desired Future Condition

Sites for potential riparian habitat will be in proper functioning condition and following natural succession. Native vegetation will be present throughout the river corridor without competition from exotic, invasive species. Soil erosion and compaction from human use is minimized and areas around campsites support natural vegetation. Return of natural flows and less impact from man-made controls.

Standard

A score of 80%, or health in an upward trend.

Monitoring

Riparian health assessment.

Management Actions

Actions would occur when visitor use is determined to be the major impacting factor.

- Rest/rotate Level 3 and 4 sites.
- Close Level 3 and 4 sites as necessary.

Indicator 4. The condition class or rating of homestead historical interpretive sites (rating to be developed).

Desired Future Condition

Condition of homesteads will be adequate to maintain eligibility to the National Register of Historic Places.

Standard

A quantitative rating or score that preserves the historic and interpretive value of the time period in which the homestead was established.

Monitoring

Establish a baseline rating or score with parameters indicative of condition of building interior, exterior, contents and surrounding grounds. Monitoring will be completed at the end of each season of use.

Management Actions

As needed to maintain historic and interpretive value. Actions would occur when visitor use is determined to be the major impacting factor:

- Develop a sign-in log book.
- Develop and post a list of visitor use restrictions.
- Close doors to interior building access.
- Develop exclosures to keep visitors away from buildings.
- Close sites to visitor use.

Indicator 5. Increase of weed infestations adjacent to or within recreation sites and trails.

Desired Future Condition

Major trails and other high use areas will be free of weed infestations.

Standard

No increase of weed infestations beyond baseline.

Monitoring

Annual assessment and inventory.

Management Actions

As needed to maintain weed infestation standards:

- Aggressive visitor education program.
- Chemical and biological treatment.
- Closure of campsites and trails in highly infested areas.

Alternative D

Topic: Opportunities for Boaters

Indicators, Desired Future Conditions, Standards and Actions to manage visitor use opportunities within Limits of Acceptable Change.

Indicator 1. Sight and sound levels that create opportunities for privacy, solitude, and a primitive boating and camping experience

Desired Future Condition

Visitors will have the opportunity to experience solitude, free from sight and sound of other groups, on some portion of their trip. Visitors will have the opportunity to camp in primitive sites that reflect natural qualities of the river environment.

Standard

One occurrence of 170 people launching per day (based on a running 3-day average) from a total of all sites located between the Chouteau County Fairgrounds Campground and Canoe Launch, and Coal Banks Landing.

Two occurrences of 100 people launching per day (based on a running 3-day average) from a total of all sites located between Judith Landing and the James Kipp Recreation Area.

Monitoring

Analysis of boater registration data.

Management Actions

The following is a list of actions managers could select as needed to maintain the sight and sound standard. Other actions may be developed as needed to adapt to changes in visitor use patterns.

- Create a web-based mandatory registration system that would provide information to potential boaters regarding high use launch days. This would allow boaters the option of selecting dates outside of busy timeframes.
- Encourage boaters to stagger launches at the put-in (don't launch until the group in front is out of sight and sound) and when leaving camp on subsequent days.
- Encourage groups of boaters to stay in a compact flotilla. Discourage boaters from spreading out with wide distances between boats in the same party.
- From June 15 to August 1, require groups larger than 20 people to launch on Wednesday, Thursday or Friday.
- From June 15 to August 1, require groups larger than 20 people camping between Coal Banks Landing and Judith Landing to camp only in Level 2 sites, and begin to identify Level 4 camping opportunities on the floater maps.
- From June 15 to August 1, limit all groups to a one-night stay at any Level 2, 3 or 4 site between Coal Banks Landing and the James Kipp Recreation Area.
- Pursue purchase or lease of sites to develop additional Level 2 and 3 camping opportunities.
- Develop additional Level 3 primitive boat camps on existing public land.
- Construct additional Level 2 sites in areas where visual integrity could be maintained.
- Require groups of 20 people or larger to acquire an SRP with stipulations on the date they can launch and where they can camp.
- Develop and implement a group size limit of 20 people. If this group size limit does not effectively reduce impacts, then smaller group size limits may be considered.
- Develop and implement a temporary, one-time emergency allocation system.
- Develop and implement a seasonal allocation system (e.g., June 15 to August 1).

- Develop and implement an allocation only for the White Cliffs section of the river.
- Develop and implement a river-wide allocation system.

Indicator 2. The condition class of Level 2, 3 and 4 sites (excellent, good, fair, poor).

Desired Future Condition

The Upper Missouri River will contain a diverse set of camping and visitor opportunities and there will be fair access to campsites among all types of users. Campsites along the river will reflect natural qualities and have minimal congestion. A range of camping opportunities will be present from Fort Benton to Judith Landing. From Judith Landing to the James Kipp Recreation Area opportunities for primarily primitive camping will be present.

Standard

All Level 3 and 4 sites in the designated wild and scenic sections will be in good or excellent condition. All Level 3 and 4 sites in designated recreation sections will be in fair or better condition. Level 2 sites in any designated section will be in fair or better condition.

Monitoring

Measure the disturbance to individual campsites. Campsite monitoring will be conducted in August and September. Level 3 and 4 sites in designated wild and scenic sections will be monitored each year. Level 3 and 4 sites in designated recreation sections will be monitored every 2 years. Level 2 sites in any designated section will be monitored every 2 years.

Management Actions

As needed to maintain class standard:

- Aggressively promote Leave No Trace standards and use of existing sites.
- Promote use of current Level 2 sites (concentrate use).
- Modify current Level 2 sites to provide for screening and privacy and provide surface hardening in areas of high use (fire rings, restrooms, social trails).
- Rest and rotate individual sites.
- Close and rehabilitate individual sites.
- Develop a maximum group size for Level 3 and 4 sites.
- Purchase short-term leases from private landowners to create additional Level 3 and 4 opportunities.

Indicator 3. River corridor riparian health assessment score

Desired Future Condition

Sites for potential riparian habitat will be in proper functioning condition and following natural succession. Native vegetation will be present throughout the river corridor without competition from exotic, invasive species. Soil erosion and compaction from human use is minimized and areas around campsites support natural vegetation. Return of natural flows and less impact from man-made controls.

Standard

A score of 80%, or health in an upward trend.

Monitoring

Riparian health assessment.

Management Actions

Actions would occur when visitor use is determined to be the major impacting factor.

- Rest/rotate Level 3 and 4 sites.
- Close Level 3 and 4 sites as necessary.

Indicator 4. The condition class or rating of homestead historical interpretive sites

Desired Future Condition

Condition of homesteads will be adequate to maintain eligibility to the National Register of Historic Places.

Standard

A quantitative rating or score that preserves the historic and interpretive value of the time period in which the homestead was established.

Monitoring

Establish a baseline rating or score with parameters indicative of condition of building interior, exterior, contents and surrounding grounds. Monitoring will be completed at the end of each season of use.

Management Actions

As needed to maintain historic and interpretive value:

- Develop a sign-in log book.
- Develop and post a list of visitor use restrictions.
- Close doors to interior building access.
- Develop exclosures to keep visitors away from buildings.
- Close sites to visitor use.

Indicator 5. Increase of weed infestations adjacent to or within recreation sites and trails

Desired Future Condition

Major trails and other high use areas will be free of weed infestations.

Standard

No increase of weed infestations beyond baseline.

Monitoring

Annual Assessment and Inventory.

Management Actions

As needed to maintain weed infestation standards:

- Aggressive visitor education program.
- Chemical and biological treatment.
- Closure of campsites and trails in highly infested areas.

APPENDIX R
Wildlife

R.1 Wildlife Mitigation Noise Levels

The following wildlife mitigation measures will be considered for production facilities and heavy equipment.

1. For all areas in the Monument, no more than 49 decibels (dB) at 300 feet from all production equipment (BLM 2003c).

2. Restrict noise levels from production facilities to 49 dB (10 dB above background noise at the lek). (Management Plan and Conservation Strategies for Sage Grouse in Montana – Final 2005)

3. Restrict use of heavy equipment that exceeds 49 dB within 2 miles of a lek from 4 a.m. – 8 a.m. and 7 p.m. – 10 p.m. during March 1 – June 15 (Management Plan and Conservation Strategies for Sage Grouse in Montana – Final 2005).

4. Noise restriction during drilling/construction would only be limited as per guidelines for sage grouse in the Management Plan and Conservation Strategies for Sage Grouse in Montana – Final 2005.

For comparison, Table R.1.1 provides the noise level and human response for various sources.

Table R.1.1
Noise Levels and Human Response

Common Sounds	*Noise Levels (dB)*	*Effect*
Jet engine (near)	140	
Shotgun firing Jet takeoff (100-200 ft.)	130	Threshold of pain
Thunderclap (near Discotheque	120	Threshold of sensation
Power saw Pneumatic drill Rock music band	110	Regular exposure of more than 1 min. risks permanent hearing loss
Garbage truck	100	No more than 15 min. unprotected exposure recommended
Subway Motorcycle Lawnmower	90	Very annoying
Electric razor Many industrial workplaces	85	Level at which hearing damage begins (8 hours)
Average city traffic noise Garbage disposal	80	Annoying. Interferes with conversation
Vacuum cleaner Hair dryer Inside a car	70	Intrusive. Interferes with telephone conversation
Normal conversation	60	
Quiet office Air conditioner	50	Comfortable
Whisper	30	Very quiet
Normal breathing	10	Just audible
	0	Threshold of normal hearing (1000-4000 Hertz)

Source: The Canadian Hearing Society, http://www.chs.ca/info/noise/levels.html.

R.2 Fish, Wildlife, Herptofauna, and Avian Species Found within the Monument

Fish

Common Name	*Scientific Name*	*Native or Introduced*	*Occurrence*	*Species Status*
Bigmouth Buffalo	*Ictiobus cyprinellus*	Native	Seasonally Common	
Black Bullhead	*Ictalurus melas*	Introduced	Rare	
Black Crappie	*Pomoxis nigromaculatus*	Introduced	Uncommon	
Blue Sucker	***Cycleptus elongatus***	**Native**	**Common**	**Sensitive**
Brassy Minnow	*Hybognathus hankinsoni*	Native	Uncommon	
Brook Trout	*Salvelinus fontinalis*	Introduced	Incidental	
Brook Stickleback	*Culaea inconstans*	Native	Uncommon	
Brown Trout	*Salmo trutta*	Introduced	Uncommon	
Burbot	*Lota lota*	Native	Uncommon	
Carp	*Cyprinus carpio*	Introduced	Abundant	
Channel Catfish	*Ictalurus punctatus*	Native	Common	
Chinook Salmon	*Oncorhynchus tshawytscha*	Introduced	Rare	
Cisco	*Coregonus artedi*	Introduced	Uncommon	
Emerald Shiner	*Notropis atherinoides*	Native	Abundant	
Fathead Minnow	*Pimephales promelas*	Native	Common	
Flathead Chub	*Hybopsis gracilis*	Native	Abundant	
Freshwater Drum	*Aplodinotus grunniens*	Native	Uncommon	
Goldeye	*Hiodon alosoides*	Native	Abundant	
Goldfish	*Carassius auratus*	Introduced	Rare	
Iowa Darter	*Etheostoma exile*	Native	Uncommon	
Lake Chub	*Couesius plumbeus*	Native	Common	
Longnose Dace	*Rhinichthys cataractae*	Native	Common	
Longnose Sucker	*Catostomus catostomus*	Native	Common	
Mottled Sculpin	*Cottus bairdi*	Native	Uncommon	
Mountain Sucker	*Catostomus platyrhynchus*	Native	Uncommon	
Mountain Whitefish	*Prosopium williamsoni*	Native	Uncommon	
Northern Pike	*Esox lucius*	Introduced	Common	
Northern Redbelly X Finescale Dace	***Phoxinus eos x phoxinus neogaeus***	**Native**	**Rare**	**Sensitive**
Paddlefish	***Polyodon spathula***	**Native**	**Seasonally common**	**Sensitive**
Pallid Sturgeon	***Scaphirhynchus albus***	**Native**	**Rare**	**Endangered**
Pearl Dace	***Semotilus/Margariscus margarita***	**Native**	**Rare**	**Sensitive**
Plains Minnow	*Hybognathus placitus*	Native	Uncommon	
Pumpkinseed	*Lepomis gibbosus*	Native	Rare	
Rainbow Trout	*Salmo gairdneri*	Introduced	Uncommon	
River Carpsucker	*Carpiodes carpio*	Native	Abundant	
Sand Shiner	*Notropis stramineus*	Native	Rare	
Sauger	***Stizostedion canadense***	**Native**	**Common**	**Sensitive**
Shorthead Redhorse	*Moxostoma macrolepidotum*	Native	Abundant	
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	Native	Common	
Sicklefin Chub	***Macrhybopsis meeki***	**Native**	**Common**	**Sensitive**

Common Name	*Scientific Name*	*Native or Introduced*	*Occurrence*	*Species Status*
Smallmouth Bass	*Micropterus dolomieui*	Introduced	Uncommon	
Smallmouth Buffalo	*Ictiobus bubalus*	Native	Common	
Spottail Shiner	*Notropis hudsonius*	Introduced	Uncommon	
Stonecat	*Noturus flavus*	Native	Common	
Sturgeon Chub	***Hybopsis gelida***	**Native**	**Common**	**Sensitive**
Walleye	*Stizostedion vitreum*	Introduced	Common	
Western Silvery Minnow	*Hybognathus nuchalis*	Native	Abundant	
White Crappie	*Pomoxis annularis*	Introduced	Uncommon	
White Sucker	*Catostomus commersoni*	Native	Common	
Yellow Perch	*Perca flavescens*	Introduced	Uncommon	

Mammals

Common Name	*Scientific Name*	*Species Status*
Badger	*Taxidea taxus*	
Beaver	*Castor canadensis*	
Big Brown Bat	*Eptesicus fuscus*	
Bighorn Sheep	*Ovis canadensis*	
Black-tailed Prairie Dog	***Cynomys ludovicianus***	**Sensitive**
Bobcat	*Lynx rufus*	
Bushy Tail Woodrat	*Neotoma cinerea*	
Coyote	*Canis latrans*	
Deer Mouse	*Peromyscus maniculatus*	
Desert Cottontail	*Sylvilagus audubonii*	
Dwarf Shrew	*Sorex nanus*	
Hayden's Shrew	*Sorex haydeni*	
Hoary Bat	*Lasiurus cinereus*	
House Mouse	*Mus musculus*	
Least Chipmunk	*Tamias minimus*	
Least Weasel	*Mustela nivalis*	
Little Brown Myotis (Bat)	*Myotis lucifugus*	
Long-eared Myotis (Bat)	*Myotis evotis*	**Sensitive**
Long-legged Myotis (Bat)	*Myotis volans*	**Sensitive**
Long-tailed Vole	*Microtus longicaudus*	
Long-tailed Weasel	*Mustela frenata*	
Masked Shrew	*Sorex cinereus*	
Meadow Vole	*Microtus pennsylvanicus*	
Merriam's Shrew	*Sorex merriami*	
Mink	*Mustela vison*	
Montane Shrew	*Sorex monticolus*	
Mountain Cottontail	*Sylvilagus nuttallii*	
Mountain Lion	*Puma concolor*	
Mule Deer	*Odocoileus hemionus*	
Muskrat	*Ondatra zibethicus*	
Northern Grasshopper Mouse	*Onychomys leucogaster*	

Common Name	*Scientific Name*	*Species Status*
Northern Pocket Gopher	*Thomomys talpoides*	
Northern Water Shrew	*Sorex palustris*	
Olive-backed Pocket Mouse	*Perognathus fasciatus*	
Ord's Kangaroo Rat	*Dipodomys ordii*	
Porcupine	*Erethizon dorsatum*	
Prairie Vole	*Microtus ochrogaster*	
Preble's Shrew	*Sorex preblei*	
Pronghorn	*Antilocapra americana*	
Raccoon	*Procyon lotor*	
Red Bat	*Lasiurus borealis*	
Red Fox	*Vulpes vulpes*	
Red Squirrel	*Tamiasciurus hudsonicus*	
Richardson's Ground Squirrel	*Spermophilus richardsonii*	
River Otter	*Lontra canadensis*	
Rocky Mountain Elk	*Cervus elaphus*	
Sagebrush Vole	*Lemmiscus curatus*	
Short-tailed Weasel	*Mustela erminea*	
Silver-haired Bat	*Lasionycteris noctivagans*	
Striped Skunk	*Mephitis mephitis*	
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	
Townsend's Big-eared Bat	***Corynorhinus townsendii***	**Sensitive**
Western Harvest Mouse	*Reithrodontomys megalotis*	
Western Jumping Mouse	*Zapus princeps*	
Western Small-footed Myotis (Bat)	*Myotis ciliolabrum*	
White-footed Mouse	*Peromyscus leucopus*	
White-tailed Jackrabbit	*Lepus townsendii*	
White-tailed Deer	*Odocoileus virginianus*	
Yellow-bellied Marmot	*Marmota flaviventris*	
Yellow-pine Chipmunk	*Tamias amoenus*	
Yuma Myotis (Bat)	*Myotis yumanensis*	

Herptofauna

Common Name	*Scientific Name*	*Species Status*
Bull Snake	*Pituopis melanoleucus sayi*	
Garter Snake	*Thamnophis spp.*	
Great Plains Toad	***Bufo cognatus***	**Sensitive**
Greater short-horned Lizard	***Phrynosoma hernandesi hernandesi***	**Sensitive**
Milk Snake	*Lampropeltis triangulum*	
Northern Leopard Frog	***Rana pipiens***	**Sensitive**
Plains Spadefoot Toad	***Spea bombifrons***	**Sensitive**
Eastern Yellowbelly Racer	*Coluber constrictor flaviventris*	
Sagebrush Lizard	*Sceloporus graciosus (Phrynosomatidae)*	
Snapping Turtle	***Chelydra spp.***	**Sensitive**
Spiny Softshell Turtle	***Trionyx spiniferus***	**Sensitive**

Common Name	*Scientific Name*	*Species Status*
Tiger Salamander	*Ambystoma tigrinum*	
Western Chorus Frog	*Pseudacris triseriata*	
Western Hog-nosed Snake	***Heterodon nasicus***	**Sensitive**
Western Rattlesnake	*Crotalus viridis*	
Woodhouse's Toad	*Bufo woodhousii*	

Avian

Common Name	*Scientific Name*	*Species Status*
American Avocet	*Recurvirostra americana*	
American Bittern	*Botaurus lentiginosus*	
American Coot	*Fulica americana*	
American Crow	*Corvus brachyrhynchos*	
American Goldfinch	*Carduelis tristis*	
American Kestrel	*Falco sparverius*	
American Pipit	*Anthus rubescens*	
American Redstart	*Setophaga ruticilla*	
American Robin	*Turdus migratorius*	
American Tree Sparrow	*Spizella arborea*	
American White Pelican	*Pelecanus erythrorhynchos*	
American Wigeon	*Anas americana*	
Baird's Sandpiper	*Calidris bairdii*	
Bairds Sparrow	***Ammodramus bairdii***	**Sensitive**
Bald Eagle	***Haliaeetus leucocephalus***	**Sensitive**
Baltimore Oriole	*Icterus galbula*	
Bank Swallow	*Riparia riparia*	
Barn Swallow	*Hirundo rustica*	
Belted Kingfisher	*Ceryle alcyon*	
Black and White Warbler	*Mniotilta varia*	
Black Tern	***Chlidonias niger***	**Sensitive**
Black-billed Cuckoo	*Coccyzus erythropthalmus*	
Black-billed Magpie	*Pica hudsonia*	
Black-capped Chickadee	*Poecile atricapilla*	
Black-crowned Night Heron	*Nycticorax nycticorax*	
Black-headed Grosbeak	*Pheucticus melanocephalus*	
Black-necked Stilt	*Himantopus mexicanus*	
Blackpoll Warbler	*Dendroica striata*	
Blue-winged Teal	*Anas discors*	
Bobolink	*Dolichonyx oryzivorus*	
Bohemian Waxwing	*Bombycilla garrulus*	
Bonaparte's Gull	*Larus philadelphia*	
Brewer's Blackbird	*Euphagus cyanocephalus*	
Brewer's Sparrow	***Spizella breweri***	**Sensitive**
Brown Creeper	*Certhia americana*	
Brown Thrasher	*Toxostoma rufum*	

Common Name	*Scientific Name*	*Species Status*
Brown-headed Cowbird	*Molothrus ater*	
Bufflehead	*Bucephala albeola*	
Bullock's Oriole	*Icterus bullockii*	
Burrowing Owl	***Athene cunicularia***	**Sensitive**
California Gull	*Larus californicus*	
Canada Goose	*Branta canadensis*	
Canvasback Duck	*Aythya valisineria*	
Cassin's Finch	*Carpodacus cassinii*	
Cedar Waxwing	*Bombycilla cedrorum*	
Chestnut-collared Longspur	***Calcarius ornatus***	**Sensitive**
Chipping Sparrow	*Spizella passerina*	
Cinnamon Teal	*Anas cyanoptera*	
Clark's Nutcracker	*Nucifraga columbiana*	
Clay-colored Sparrow	*Spizella pallida*	
Cliff Swallow	*Petrochelidon pyrrhonota*	
Common Goldeneye	*Bucephala clangula*	
Common Grackle	*Quiscalus quiscula*	
Common Merganser	*Mergus merganser*	
Common Nighthawk	*Chordeiles minor*	
Common Poorwill	*Phalaenoptilus nuttallii*	
Common Raven	*Corvus corax*	
Common Redpoll	*Carduelis flammea*	
Common Snipe	*Gallinago gallinago*	
Common Tern	*Sterna hirundo*	
Common Yellowthroat	*Geothlypis trichas*	
Cooper's Hawk	*Accipiter cooperii*	
Dark-eyed Junco	*Junco hyemalis*	
Double-crested Cormorants	*Phalacrocorax auritus*	
Downy Woodpecker	*Picoides pubescens*	
Dusky Flycatcher	*Empidonax oberholseri*	
Eared Grebe	*Podiceps nigricollis*	
Eastern Kingbird	*Tyrannus tyrannus*	
European Starling	*Sturnus vulgaris*	
Evening Grosbeak	*Coccothraustes vespertinus*	
Ferruginous Hawk	***Buteo regalis***	**Sensitive**
Forster's Tern	*Sterna forsteri*	
Fox Sparrow	*Passerella iliaca*	
Franklin's Gull	***Larus pipixcan***	**Sensitive**
Gadwall	*Anas strepera*	
Golden Crowned Kinglet	*Regulus satrapa*	
Golden Eagle	***Aquila chrysaetos***	**Sensitive**
Grasshopper Sparrow	*Ammodramus savannarum*	
Gray Catbird	*Dumetella carolinensis*	
Gray Partridge	*Perdix perdix*	
Gray-crowned Rosy-Finch	*Leucosticte tephrocotis*	

Common Name	*Scientific Name*	*Species Status*
Great Blue Heron	*Ardea herodias*	
Great Horned Owl	*Bubo virginianus*	
Greater Sage-Grouse	***Centrocercus urophasianus***	**Sensitive**
Greater Yellowlegs	*Tringa melanoleuca*	
Green-tailed Towhee	*Pipilo chlorurus*	
Green-winged Teal	*Anas crecca*	
Hairy Woodpecker	*Picoides villosus*	
Harris's Sparrow	*Zonotrichia querula*	
Hermit Thrush	*Catharus guttatus*	
Herring Gull	*Larus argentatus*	
Hooded Merganser	*Lophocytes cucullatus*	
Horned Grebe	*Podiceps auritus*	
Horned Lark	*Eremophila alpestris*	
House Finch	*Carpodacus mexicanus*	
House Sparrow	*Passer domesticus*	
House Wren	*Troglodytes aedon*	
Killdeer	*Charadrius vociferus*	
Lapland Longspur	*Calcarius lapponicus*	
Lark Bunting	*Calamospiza melanocorys*	
Lark Sparrow	*Chondestes grammacus*	
Lazuli Bunting	*Passerina amoena*	
Least Flycatcher	*Empidonax minimus*	
Least Sandpiper	*Calidris minutilla*	
Least Tern	*Sterna antillarum*	
Lesser Scaup	*Aythya affinis*	
Lesser Yellowlegs	*Tringa flavipes*	
Lewis's Woodpecker	*Melanerpes lewis*	
Lincoln's Sparrow	*Melospiza lincolnii*	
Loggerhead Shrike	***Lanius ludovicianus***	**Sensitive**
Long-billed Curlew	***Numenius americanus***	**Sensitive**
Long-billed Dowitcher	*Limnodromus scolopaceus*	
Long-eared Owl	*Asio otus*	
MacGillivray's Warbler	*Oporornis tolmiei*	
Mallard	*Anas platyrhynchos*	
Marbled Godwit	***Limosa fedoa***	**Sensitive**
Marsh Wren	*Cistothorus palustris*	
McCown's Longspur	***Calcarius mccownii***	**Sensitive**
Merlin	*Falco columbarius*	
Mountain Bluebird	*Sialia currucoides*	
Mountain Chickadee	*Poecile gambeli*	
Mountain Plover	***Charadrius montanus***	**Sensitive**
Mourning Dove	*Zenaida macroura*	
Northern Flicker	*Colaptes auratus*	
Northern Goshawk	***Accipiter gentilis***	**Sensitive**
Northern Harrier	*Circus cyaneus*	

Common Name	*Scientific Name*	*Species Status*
Northern Pintail	*Anas acuta*	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	
Northern Shoveler	*Anas clypeata*	
Northern Shrike	*Lanius excubitor*	
Northern Waterthrush	*Seiurus noveboracensis*	
Olive-sided Flycatcher	*Contopus cooperi*	
Orange-crowned Warbler	*Vermivora celata*	
Osprey	*Pandion haliaetus*	
Ovenbird	*Seiurus aurocapillus*	
Pectoral Sandpiper	*Calidris melanotos*	
Peregrine Falcon	***Falco peregrinus***	**Sensitive**
Pied-billed Grebe	*Podilymbus podiceps*	
Pine Siskin	*Carduelis pinus*	
Piping Plover	*Charadrius melodus*	
Prairie Falcon	*Falco mexicanus*	
Red Crossbill	*Loxia curvirostra*	
Red-breasted Merganser	*Mergus serrator*	
Red-breasted Nuthatch	*Sitta canadensis*	
Red-eyed Vireo	*Vireo olivaceus*	
Redhead	*Aythya americana*	
Red-headed Woodpecker	***Melanerpes erythrocephalus***	**Sensitive**
Red-naped Sapsucker	*Sphyrapicus nuchalis*	
Red-tailed Hawk	*Buteo jamaicensis*	
Red-winged Blackbird	*Agelaius phoeniceus*	
Ring-billed Gull	*Larus delawarensis*	
Ring-necked Duck	*Aythya collaris*	
Ring-necked Pheasant	*Phasianus colchicus*	
Rock Dove	*Columba livia*	
Rock Wren	*Salpinctes obsoletus*	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	
Ross's Goose	*Chen rossii*	
Rough-legged Hawk	*Buteo lagopus*	
Ruby Crowned Kinglet	*Regulus calendula*	
Ruddy Duck	*Oxyura jamaicensis*	
Rusty Blackbird	*Euphagus carolinus*	
Sage Thrasher	***Oreoscoptes montanus***	**Sensitive**
Sandhill Crane	*Grus canadensis*	
Savannah Sparrow	*Passerculus sandwichensis*	
Say's Phoebe	*Sayornis saya*	
Semipalmated Plover	*Chardrius semipalmatus*	
Semipalmated Sandpiper	*Calidris pusilla*	
Sharp-shinned Hawk	*Accipiter striatus*	
Sharp-tailed Grouse	*Tympanuchus phasianellus*	
Short-eared Owl	*Asio flammeus*	
Snow Bunting	*Plectrophenax nivalis*	

Common Name	*Scientific Name*	*Species Status*
Snow Goose	*Chen caerulescens*	
Snowy Owl	*Nyctea scandiaca*	
Solitary Sandpiper	*Tringa solitaria*	
Song Sparrow	*Melospiza melodia*	
Sora	*Porzana carolina*	
Spotted Sandpiper	*Actitus macularia*	
Spotted Towhee	*Pipilo maculatus*	
Sprague's Pipit	***Anthus spragueii***	**Sensitive**
Swainson's Hawk	***Buteo swainsoni***	**Sensitive**
Swainson's Thrush	*Catharus ustulatus*	
Tennessee Warbler	*Vermivora peregrina*	
Townsend's Solitaire	*Myadestes townsendi*	
Tree Swallow	*Tachycineta bicolor*	
Tundra Swan	*Cygnus columbianus*	
Turkey Vulture	*Cathartes aura*	
Upland Sandpiper	*Bartramia longicauda*	
Veery	*Catharus fuscescens*	
Vesper Sparrow	*Pooecetes gramineus*	
Violet-green Swallow	*Tachycineta thalassina*	
Virginia Rail	*Rallus limicola*	
Warbling Vireo	*Vireo gilvus*	
Western Bluebird	*Sialia mexicana*	
Western Grebe	*Aechmophorus occidentalis*	
Western Kingbird	*Tyrannus verticalis*	
Western Meadowlark	*Sturnella neglecta*	
Western Tanager	*Piranga ludoviciana*	
Western Wood-Pewee	*Contopus sordidulus*	
White-breasted Nuthatch	*Sitta carolinensis*	
White-crowned Sparrow	*Zonotrichia leucophrys*	
White-faced Ibis	***Plegadis chihi***	**Sensitive**
White-fronted Goose	*Anser albifrons*	
White-throated Sparrow	*Zonotrichia albicollis*	
White-winged Crossbill	*Loxia leucoptera*	
Wild Turkey	*Meleagris gallopavo*	
Willet	***Catoptrophorus semipalmatus***	**Sensitive**
Willow Flycatcher	*Empidonax traillii*	
Wilson's Phalarope	***Phalaropus tricolor***	**Sensitive**
Wilson's Warbler	*Wilsonia pusilla*	
Wood Duck	*Aix sponsa*	
Yellow Warbler	*Dendroica petechia*	
Yellow-breasted Chat	*Icteria virens*	
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	
Yellow-rumped Warbler	*Dendroica coronata*	

R.3 Determination of Potential Presence of Threatened, Endangered, or Candidate Species and BLM (Montana and Dakotas) Designated Sensitive Species

R.3.1 Federally Listed Threatened (T) and Endangered (E) Species (No Candidate Species Present)

Species	*Status*	*In Range (yes/no) **	*Habitat Present (yes/no) ***	*Effects Determination*
Bald Eagle	T	Y	Y	Habitat present is primarily foraging during fall migration and winter. There are nine nest sites and numerous wintering and casual roost sites. The recreational activity along the Missouri River "May Affect" this species, but is "Not Likely to Adversely Affect." The quantity and quality of this habitat will not be reduced appreciably. Should not impact individuals, their habitat, or their prey base. NOTE: The bald eagle was removed from the list of threatened and endangered wildlife on August 8, 2007.
Black-footed Ferret	E	Y	Y	Any prairie dog town over 80 acres is considered habitat, but small towns within the Monument will not support ferrets.
Pallid Sturgeon	E	Y	Y	Habitat is present in the Missouri River. The quantity and quality of this habitat will not be reduced and none of the proposed alternatives would affect this species.

* Range of species will indicate whether there is potential for a species to occur within the area, based on distribution determined by Montana Fish, Wildlife and Parks, Montana Natural Heritage Program, or other researchers. This does not guarantee presence.

** If suitable habitat is within the range of a species, that species is assumed to use the available habitat. This is not a guarantee of the presence of that species within the analysis area.

R.3.2 BLM (Montana and Dakotas) Designated Sensitive Species (Instruction Memorandum No. MT-2004-082)

Species	*In Range (yes/no) **	*Habitat Present (yes/no) ***	*Effects Determination*
Fish			
Blue Sucker	Y	Y	Occurs in the Missouri River.
Northern Redbelly X Finescale Dace	Y	Y	Occurs in the tributaries of the Missouri River.
Paddlefish	Y	Y	Occurs in the Missouri River.

Species	*In Range (yes/no) **	*Habitat Present (yes/no) ***	*Effects Determination*
Pearl Dace	Y	Y	Occurs in the tributaries of the Missouri River.
Sauger	Y	Y	Occurs in the Missouri River.
Sicklefin Chub	Y	?	Occurs in the tributaries of the Missouri River.
Sturgeon Chub	Y	?	Occurs in the tributaries of the Missouri River.
Mammals			
Black-tailed Prairie Dog	Y	Y	Occurs within the Monument. Benefits from livestock grazing.
Long-legged Myotis (Bat)	Y	Y	Known to occur within the Monument.
Long-eared Myotis (Bat)	Y	Y	Known to occur within the Monument.
Townsend's Big-eared Bat	Y	Y	Known to occur within the Monument.
Reptiles and Amphibians			
Great Plains Toad	Y	Y	Known to occur within the Monument.
Greater Short-horned Lizard	Y	Y	Known to occur within the Monument. Potential loss of individuals from traffic.
Northern Leopard Frog	Y	Y	Known to occur within the Monument.
Plains Spadefoot Toad	Y	Y	Known to occur within the Monument.
Snapping Turtle	Y	Y	Occurs in the Missouri River and its banks. Nesting can be affected by recreational and grazing use of muddy banks.
Spiny Softshell Turtle	Y	Y	Occurs in the Missouri River and its banks. Nesting can be affected by recreational and grazing use of muddy banks.
Western Hog-nosed Snake	Y	Y	Could occur in some parts of the Monument, but not documented.
Birds			
Bairds Sparrow	Y	Y	Small amount of potential grasslands habitat. Potential disturbance from traffic.
Bald Eagle	Y	Y	There are nine nest sites and numerous wintering and casual roost sites.
Black Tern	Y	Y	No nesting colonies have been identified within the Monument.
Brewer's Sparrow	Y	?	In the range of the species; could exist in the Monument, but not confirmed.
Burrowing Owl	Y	Y	Nesting and feeding areas on prairie dogs towns occur within the Monument.
Chestnut-collared Longspur	Y	Y	Potential disturbance from traffic.
Ferruginous Hawk	Y	Y	Occurs within the Monument, but no nests have been identified. Potential disturbance from traffic.
Franklin's Gull	Y	Y	Likely occurs on some wetlands within the Monument, although not documented.

Species	*In Range (yes/no) **	*Habitat Present (yes/no) ***	*Effects Determination*
Golden Eagle	Y	Y	Occurs within the Monument, but no nests have been identified.
Greater Sage-Grouse	Y	Y	Nesting, breeding, and wintering occurs within the Monument, but no nests have been identified. Potential disturbance from traffic and oil and gas development.
Loggerhead Shrike	Y	Y	Occurs within the Monument, but no nests have been identified. Potential disturbance from traffic.
Long-billed Curlew	Y	Y	Occurs within the Monument, but no nests have been identified. Potential disturbance from traffic.
Marbled Godwit	Y	Y	Occurs within the Monument, but no nests have been identified.
McCown's Longspur	Y	Y	Likely occurs within the Monument. Potential disturbance from traffic.
Mountain Plover	Y	Y	Two prairie dog towns have been identified as nesting habitat within the Monument.
Northern Goshawk	Y	Y	Occurs within the Monument, but no nests have been identified. Potential disturbance from traffic or construction-related activity.
Peregrine Falcon	Y	Y	Individuals have been observed and hacking has occurred within the Monument, but no nests are currently documented.
Red-headed Woodpecker	Y	Y	Has potential to occur in cottonwood/green ash galleries along the Missouri River, but none have been recorded.
Sage Thrasher	Y ?	Y	At the edge of their range; could exist in the Monument, but not confirmed.
Sprague's Pipit	Y	Y	Occurs within the Monument. Potential disturbance from traffic.
Swainson's Hawk	Y	Y	Occurs within the Monument, but no nests have been identified. Potential disturbance from traffic.
White-faced Ibis	Y	Y	Is within the range and habitat occurs along the Missouri River, but none have been documented within the Monument.
Willet	Y	Y	Occurs within the Monument. Potential disturbance from traffic.
Wilson's Phalarope	Y	Y	Occurs within the Monument. Potential disturbance from traffic.

* Range of species will indicate whether there is potential for a species to occur within the area, based on distribution determined by Montana Fish Wildlife and Parks, Montana Natural Heritage Program, or other researchers. This does not guarantee presence.

** If suitable habitat is within the range of a species, that species is assumed to use the available habitat. This is not a guarantee of the presence of that species within the analysis area.

APPENDIX S
Soil Survey Geographic (SSURGO)
Soil Mapping Units and Characteristics on BLM Lands (by Soil Survey Area)

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
BLAINE COUNTY - SSA 608								
1	ABSHER	0 - 4					Dense clay, 10-14 in. Ppt* zone, glaciated plains, central	19
	NOBE	0 - 4					Saline upland, 10-14 in. Ppt zone, glaciated plains, central	
2	ASSINNIBOINE	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, central	135
3	ATTEWAN	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, central	34
6	BADLAND[1]	35 - 70	X					33,639
11	BASCOVY	2 - 6					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	2,848
12	BASCOVY	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
	LISAM	4 - 8					Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	2,272
	DILTS	4 - 8					Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
19	BENZ	0 - 4					Saline upland, 10-14 in. Ppt zone, glaciated plains, central	288
25	CABBART	8 - 35	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	1,371
	DELPOINT	8 - 15					Silty, 10-14 in. Ppt zone, sedimentary plains, central	
27	CABBART	25 - 60	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	16,597
	ROCK OUTCROP[1]							
28	CABBART	15 - 60	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
	YAMAC	15 - 25	X				Thin silty, 10-14 in. Ppt zone, sedimentary plains, central	15
	ROCK OUTCROP[1]							
36	CREED	0 - 4					Silty, 10-14 in. Ppt zone, sedimentary plains, central	46
	GERDRUM	0 - 4					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
38	DELPOINT	2 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	291
	CABBART	2 - 8					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
39	DIMMICK CLAY	0 - 1			X		Wet meadow, 10-14 in. Ppt zone, glaciated plains, central	36

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
41	ETHRIDGE	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, central	6
47	GLENDIVE	0 - 2					Sandy, 10-14 in. Ppt zone, glaciated plains, central	1
48	HANLY	0 - 4		X			Sands, 10-14 in. Ppt zone, glaciated plains, central	1
55	HAVRE	0 - 2					Silty, 10-14 in. Ppt zone, glaciated plains, central	65
56	HAVRE	0 - 2					Silty, 10-14 in. Ppt zone, glaciated plains, central	1
59	HAVRE	0 - 2					Overflow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
	HANLY	0 - 2		X			Overflow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	1,614
	GLENDIVE	0 - 2					Overflow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
65	HEDOES	15 - 45	X				Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
	BELAIN	25 - 60	X				Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	33
	CASTNER	25 - 60	X				Thin silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
79	LISAM	8 - 35	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	18,870
	DILTS	8 - 35	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
80	LISAM	25 - 45	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
	DILTS	25 - 45	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	64,269
	ROCK OUTCROP[1]							
82	LISAM	25 - 45	X				Shallow, 10-14 in. Ppt zone, glaciated plains, central	93
	WABEK	15 - 35	X				Shallow to gravel, 10-14 in. Ppt zone, glaciated plains, central	
85	MARMARTH	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, central	205
	CABBART	2 - 8					Shallow, 10-14 in. Ppt zone, glaciated plains, central	
88	MARVAN	0 - 4					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	194
89	MARVAN	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	3,951
	BASCOVY	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
111	SHAAK	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, central	325
112	SHAAK	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, central	106
	GERDRUM	0 - 4					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
127	TWILIGHT	4 - 8					Sandy, 10-14 in. Ppt zone, sedimentary plains, central	117
	RIEDEL	4 - 8					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
128	TWILIGHT	8 - 15					Sandy, 10-14 in. Ppt zone, sedimentary plains, central	104
	RIEDEL	8 - 20					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
131	USTIC TORRIFLUVENTS	0 - 4					Subirrigated, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	2
132	VANDA	0 - 2					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	27
134	VANDA	2 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	7
	NOBE	2 - 8					Saline upland, 10-14 in. Ppt zone, sedimentary plains, central	
137	WABEK	8 - 35	X				Shallow to gravel, 10-14 in. Ppt zone, glaciated plains, central	23
147	YAMAC	2 - 4					Silty, 10-14 in. Ppt zone, sedimentary plains, central	73
148	YAMAC	0 - 4					Silty, 10-14 in. Ppt zone, sedimentary plains, central	2,651
	BENZ	0 - 4					Saline upland, 10-14 in. Ppt zone, sedimentary plains, central	
149	YAMAC	15 - 25	X				Silty, 10-14 in. Ppt zone, sedimentary plains, central	2
	WABEK	25 - 45	X				Shallow to gravel, 10-14 in. Ppt zone, sedimentary plains, central	
CHOUTEAU COUNTY - SSA 615								
15E	LAMBETH	8 - 25					Thin silty, 10-14 in. Ppt zone, glaciated plains, north	88
15F	LAMBETH	25 - 70	X				Thin silty, 10-14 in. Ppt zone, glaciated plains, north	918
16B	DEGRAND	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	2
21E	CABBART	8 - 25					Shallow, 10-14 in. Ppt zone, glaciated plains, north	71
	DELPOINT	8 - 25					Thin silty, 10-14 in. Ppt zone, glaciated plains, north	
22F	HILLON	25 - 60	X				Thin silty, 10-14 in. Ppt zone, glaciated plains, north	182
27B	ATTEWAN	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	2
28	NISHON	0 - 1			X	X[4]	Overflow, 10-14 in. Ppt zone, glaciated plains, north	15
30B	MARVAN	0 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, north	163

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
30C	MARVAN	4 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	92
32B	KOBASE	0 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, north	1
32D	KOBASE	4 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	56
33A	PHILLIPS	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	4
35B	ASSINNIBOINE	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, north	31
36B	CHINOOK	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, north	110
36C	CHINOOK	4 - 8					Sandy, 10-14 in. Ppt zone, glaciated plains, north	73
37B	EVANSTON	0 - 4				X^3	Silty, 10-14 in. Ppt zone, glaciated plains, north	295
37C	EVANSTON	4 - 8				X^3	Silty, 10-14 in. Ppt zone, glaciated plains, north	221
38B	ETHRIDGE	0 - 4				X^3	Clayey, 10-14 in. Ppt zone, glaciated plains, north	349
39B	ASSINNIBOINE	0 - 4				X^3	Silty, 10-14 in. Ppt zone, glaciated plains, north	22
48A	VANDA	0 - 2					Dense clay, 10-14 in. Ppt zone, glaciated plains, north	13
48C	VANDA	2 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, north	78
55B	LIHEN	0 - 6		X			Sands, 10-14 in. Ppt zone, glaciated plains, north	13
58B	LONNA	0 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, north	9
58C	LONNA	4 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	38
60A	HAVRE	0 - 2				X^3	Silty, 10-14 in. Ppt zone, glaciated plains, north	212
73B	YETULL	0 - 6		X			Sands, 10-14 in. Ppt zone, glaciated plains, north	13
	LONESOME	0 - 6		X			Sands, 10-14 in. Ppt zone, glaciated plains, north	
77F	TINSLEY	15 - 45					Gravel, 10-14 in. Ppt zone, glaciated plains, north	1
79B	YAMACALL	0 - 4				X^3	Silty, 10-14 in. Ppt zone, glaciated plains, north	205
79C	YAMACALL	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	639
79D	YAMACALL	8 - 15					Silty, 10-14 in. Ppt zone, glaciated plains, north	175
81A	GLENDIVE	0 - 2					Sandy, 10-14 in. Ppt zone, glaciated plains, north	156
90A	HARLAKE	0 - 1					Clayey, 10-14 in. Ppt zone, glaciated plains, north	52
93F	YETULL	15 - 45					Thin sandy, 10-14 in. Ppt zone, glaciated plains, north	256

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
94B	BUSBY	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, north	25
94C	BUSBY	4 - 8					Sandy, 10-14 in. Ppt zone, glaciated plains, north	240
94D	BUSBY	8 - 15					Sandy, 10-14 in. Ppt zone, glaciated plains, north	292
96B	MACAR	0 - 4				X[3]	Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	33
98B	KREMLIN	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	188
98C	KREMLIN	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	98
99	RIVRA	0 - 2					Greater than 10% canopy cover of deciduous trees	191
	HANLY	0 - 2		X			Greater than 10% canopy cover of deciduous trees	
141B	MEGONOT	0 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, north	
	WEINGART	0 - 2					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	28
	DELPOINT	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, north	
142C	MEGONOT	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	
	KOBASE	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	19
	DELPOINT	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	
200	BADLAND[1]		X					2,293
211F	CABBART	25 - 70	X				Shallow, 10-14 in. Ppt zone, glaciated plains, north	
	YAWDIN	25 - 70	X				Shallow clay, 10-14 in. Ppt zone, glaciated plains, north	10,920
	ROCK OUTCROP[1]							
212F	CABBART	25 - 70	X				Shallow, 10-14 in. Ppt zone, glaciated plains, north	119
	HILLON	25 - 70	X				Thin silty, 10-14 in. Ppt zone, glaciated plains, north	
221E	HILLON	8 - 25					Thin silty, 10-14 in. Ppt zone, glaciated plains, north	3
	KEVIN	8 - 15					Silty, 10-14 in. Ppt zone, glaciated plains, north	
224E	HILLON	8 - 25					Thin silty, 10-14 in. Ppt zone, glaciated plains, north	1
	JOPLIN	8 - 15					Silty, 10-14 in. Ppt zone, glaciated plains, north	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
227F	HILLON	25 - 70	X				Thin silty, 10-14 in. Ppt zone, glaciated plains, north	
	FLEAK	25 - 70	X	X			Shallow, 10-14 in. Ppt zone, glaciated plains, north	40
	ROCK OUTCROP[1]							
251E	BASCOVY	2 - 8					Thin clayey, 10-14 in. Ppt zone, glaciated plains, north	785
	NELDORE	2 - 8					Shallow clay, 10-14 in. Ppt zone, glaciated plains, north	
252C	BASCOVY	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	58
	MARVAN	2 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, north	
272C	ATTEWAN	2 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, north	23
	TINSLEY	2 - 8					Gravel, 10-14 in. Ppt zone, glaciated plains, north	
301A	MARVAN	0 - 2					Clayey, 10-14 in. Ppt zone, glaciated plains, north	40
	VANDA	0 - 2					Dense clay, 10-14 in. Ppt zone, glaciated plains, north	
301C	MARVAN	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	126
	VANDA	2 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, north	
311B	FERD	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, north	
	CREED	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	40
	GERDRUM	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	
311C	FERD	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	
	CREED	4 - 8					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	58
	GERDRUM	4 - 8					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	
331B	PHILLIPS	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, north	71
	ELLOAM	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	
331C	PHILLIPS	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	60
	ELLOAM	4 - 8					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	
361B	FORTBENTON	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, north	8
362C	CHINOOK	2 - 10					Sandy, 10-14 in. Ppt zone, glaciated plains, north	19
	YETULL	2 - 10					Sands, 10-14 in. Ppt zone, glaciated plains, north	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
363B	COZBERG	2 - 10					Sandy, 10-14 in. Ppt zone, glaciated plains, north	18
	CHINOOK	2 - 10					Sandy, 10-14 in. Ppt zone, glaciated plains, north	
363C	CHINOOK	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, north	86
	LIHEN	0 - 4					Sandy, 10-14 in. Ppt zone, glaciated plains, north	
364B	CHINOOK	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	193
365B	FORTBENTON	0 - 6					Sandy, 10-14 in. Ppt zone, glaciated plains, north	129
	CHINOOK	0 - 6					Sandy, 10-14 in. Ppt zone, glaciated plains, north	
372C	EVANSTON	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	11
	YAMACALL	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	
375B	EVANSTON	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, north	17
	LONNA	0 - 4					Silty, 10-14 in. Ppt zone, glaciated plains, north	
410	ROCK OUTCROP[1]							578
	FLEAK	25 - 70	X	X			Shallow, 10-14 in. Ppt zone, glaciated plains, north	
421C	JOPLIN	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	42
	HILLON	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	
422C	MARMARTH	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	37
441C	KEVIN	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	10
	HILLON	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	
442C	KEVIN	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	72
	ELLOAM	2 - 8					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	
460	LACEYCREEK	8 - 25					Greater than 10% canopy cover of deciduous trees	25
503B	TELSTAD	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	117
	JOPLIN	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	
503C	TELSTAD	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	96
	JOPLIN	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
521B	THOENY	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	
	ELLOAM	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, north	1
	ABSHER	0 - 4					Dense clay, 10-14 in. Ppt zone, glaciated plains, north	
561B	SCOBEY	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	70
	KEVIN	0 - 4				X[3]	Silty, 10-14 in. Ppt zone, glaciated plains, north	
561C	SCOBEY	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	98
	KEVIN	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	
601A	HAVRE	0 - 1					Silty, 10-14 in. Ppt zone, glaciated plains, north	47
	GLENDIVE	0 - 1					Sandy, 10-14 in. Ppt zone, glaciated plains, north	
602A	HAVRE	0 - 1				X[3]	Clayey, 10-14 in. Ppt zone, glaciated plains, north	29
603A	HAVRE	0 - 2					Greater than 10% canopy cover of deciduous trees	827
	GLENDIVE	0 - 2					Greater than 10% canopy cover of deciduous trees	
605C	YAMACALL	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, north	466
	HAVRE	0 - 2					Overflow, 10-14 in. Ppt zone, glaciated plains, north	
653F	FLEAK	25 - 70	X	X			Shallow, 10-14 in. Ppt zone, glaciated plains, north	
	TWILIGHT	25 - 45	X				Thin sandy, 10-14 in. Ppt zone, glaciated plains, north	417
	YETULL	25 - 70	X				Thin sandy, 10-14 in. Ppt zone, glaciated plains, north	
654F	FLEAK	25 - 70	X	X			Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	
	TWILIGHT	25 - 45	X				Thin sandy, 10-14 in. Ppt zone, glaciated plains, north	1,112
	ROCK OUTCROP[1]							
661E	TWILIGHT	8 - 25					Thin sandy, 10-14 in. Ppt zone, glaciated plains, north	479
	FLEAK	8 - 25		X			Shallow, 10-14 in. Ppt zone, glaciated plains, north	
731F	YETULL	15 - 45					Sands, 10-14 in. Ppt zone, glaciated plains, north	13
	DUNE LAND[1]							
793B	YAMACALL	6 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, north	165

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
793C	YAMACALL	4 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	75
795C	YAMACALL	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, north	150
	BENZ	2 - 8					Saline upland, 10-14 in. Ppt zone, glaciated plains, north	
795D	YAMACALL	8 - 15					Clayey, 10-14 in. Ppt zone, glaciated plains, north	13
	BENZ	8 - 15					Saline upland, 10-14 in. Ppt zone, glaciated plains, north	
892F	WHITLASH	25 - 60	X				Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
	BELAIN	25 - 45	X				Silty, steep, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	36
	ROCK OUTCROP[1]							
925F	SUNBURST	25 - 70	X				Thin clayey, 10-14 in. Ppt zone, glaciated plains, north	189
	LAMBETH	25 - 70	X				Thin silty, 10-14 in. Ppt zone, glaciated plains, north	
941D	BUSBY	4 - 15					Sandy, 10-14 in. Ppt zone, glaciated plains, north	79
	TWILIGHT	8 - 15					Sandy, 10-14 in. Ppt zone, glaciated plains, north	
971F	NELDORE	25 - 60	X				Shallow clay, 10-14 in. Ppt zone, glaciated plains, north	8,016
	BASCOVY	25 - 45	X				Thin clayey, 10-14 in. Ppt zone, glaciated plains, north	
972F	NELDORE	25 - 70	X				Shallow clay, 10-14 in. Ppt zone, glaciated plains, north	5,387
	ROCK OUTCROP[1]							
974F	NELDORE	25 - 70	X				Shallow clay, 10-14 in. Ppt zone, glaciated plains, north	846
	HILLON	25 - 70	X				Thin silty, 10-14 in. Ppt zone, glaciated plains, north	
FERGUS COUNTY - SSA 027								
3	ABOR	15 - 45	X				Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
	THEBO	15 - 45	X				Clayey, 10-14 in. Ppt zone, sedimentary plains, central	914
	CRAGO	15 - 45	X				Silty, limy, 10-14 in. Ppt zone, sedimentary plains, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
4	ABOR	4 - 15					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	56
	YAWDIM	4 - 15					Shallow , 10-14 in. Ppt zone, sedimentary plains, central	
22	ASHUELOT VAR.	0 - 4					Shallow , 10-14 in. Ppt zone, sedimentary plains, central	2
	CRAGO	0 - 4					Silty, limy, 10-14 in. Ppt zone, sedimentary plains, central	
37	CABBA	4 - 8					Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
	DONEY	4 - 8					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	4
	WAYDEN	4 - 8					Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
51	CREED	0 - 2					Silty, 10-14 in. Ppt zone, sedimentary plains, central	38
	GERDRUM	0 - 2					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
52	CREED	2 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	8
	GERDRUM	2 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
55	DANVERS	0 - 2				X[2]	Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	3
62	DELPOINT	4 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	78
	YAWDIM	4 - 8					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
64	DILTS	15 - 50	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	
	JULIN	15 - 25	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	41,107
	ROCK OUTCROP[1]							
65	DILTS	4 - 50	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	
	THEBO	4 - 45	X				Clayey, 10-14 in. Ppt zone, sedimentary plains, central	4,921
	NELDORE	4 - 60	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	
67	DONEY	15 - 60	X				Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	161
	WAYDEN	15 - 50	X				Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
68	DONEY	8 - 15					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	1
	WINDHAM	8 - 15					Silty, limy, 15-19 in. Ppt zone, northern Rocky Mtn. valleys, central	
69	DONEY	15 - 45	X				Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	67
	WINDHAM	25 - 45	X				Silty, limy, 15-19 in. Ppt zone, northern Rocky Mtn. valleys, central	
75	DOUGHTY	0 - 2					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	26
	SIPPLE	0 - 2					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
80	ELTSAC	8 - 25					Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	1
	NORBER	8 - 25					Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
82	ENBAR	0 - 2				X[2]	Subirrigated, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	92
87	ETHRIDGE	0 - 2				X[3]	Clayey, 10-14 in. Ppt zone, sedimentary plains, central	13
88	ETHRIDGE	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	194
90	EVANSTON	0 - 2					Silty, 10-14 in. Ppt zone, sedimentary plains, central	34
91	EVANSTON	2 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	40
97	FARNUF	0 - 4				X[2]	Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	16
103	FLASHER	25 - 35	X	X			Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
	TALLY	25 - 45	X				Sandy, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	81
	ROCK OUTCROP[1]							
104	FLOWEREE	2 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	204
111	GERDRUM	0 - 4					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	325
112	GERDRUM	0 - 2					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	107
	ABSHER	0 - 2					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
113	GERDRUM	2 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	265
	ABSHER	2 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
115	HARLEM	0 - 2				X[3]	Overflow, 10-14 in. Ppt zone, sedimentary plains, central	124
116	HAVRE	0 - 2					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	134
117	HAVRE	0 - 2					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	261

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
118	HAVRE	0 - 2					Overflow, 10-14 in. Ppt zone, sedimentary plains, central	4,969
	HARLEM	0 - 2					Overflow, 10-14 in. Ppt zone, sedimentary plains, central	
141	KOBAR	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	1,052
142	KOBAR	2 - 25					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	1,778
144	KORCHEA	0 - 2					Silty, 20+ in. Ppt zone, northern Rocky Mtn. foothills, central	94
	FRAZER	0 - 2					Overflow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
146	LAWTHER	4 - 8					Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	1
160	MARIAS	0 - 2					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	31
161	MARIAS	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	177
162	MARMARTH	2 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	26
163	MARMARTH	4 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	328
	CABBART	4 - 8					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
165	MARTINSDALE	4 - 8					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	13
	JUDITH	4 - 8					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
174	NELDORE	4 - 25					Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	6,261
	THEBO	4 - 25					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
175	NELDORE	25 - 60	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	6,907
	THEBO	25 - 45	X				Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
176	NELDORE	15 - 60	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	23,073
	ROCK OUTCROP[1]							
178	NESDA	0 - 2					Greater than 10% canopy cover of deciduous trees	77
	SUDWORTH	0 - 2					Greater than 10% canopy cover of deciduous trees	
182	PENDROY	0 - 4					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	158
190	ROCK OUTCROP[1]							17,212
199	SHAMBO	0 - 2				X[2]	Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	5
200	SHAMBO	2 - 8					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	23
215	TALLY	2 - 8				X[2]	Sandy, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	63

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
216	TALLY	4 - 25					Sandy, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	1
	FLASHER	8 - 25		X			Shallow, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
221	TAMANEEN	2 - 4				X[3]	Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	2
	JUDITH	2 - 4				X[3]	Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
222	TANNA	0 - 4				X[3]	Clayey, 10-14 in. Ppt zone, sedimentary plains, central	8
223	TANNA	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	140
	ABOR	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
233	THEBO	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	326
234	THEBO	8 - 25					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	2,774
235	THEBO	4 - 15					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	
	WEINGART	4 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	1,846
	ABSHER	4 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
252	VANDA	0 - 8					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	151
253	VANDA	0 - 4					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	220
	NOBE	0 - 4					Saline upland, 10-14 in. Ppt zone, sedimentary plains, central	
275	WINIFRED	15 - 45	X				Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
	WINDHAM	15 - 45	X				Silty, limy, 15-19 in. Ppt zone, northern Rocky Mtn. valleys, central	45
	ELTSAC	15 - 45	X				Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
277	WORK	2 - 8					Silty, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	9
278	YAMAC	2 - 8					Silty, 10-14 in. Ppt zone, sedimentary plains, central	587
279	YAMAC	4 - 25					Silty, 10-14 in. Ppt zone, sedimentary plains, central	
	DELPOINT	4 - 25					Silty, 10-14 in. Ppt zone, sedimentary plains, central	2,583
	YAWDIM	4 - 25					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
281	YAWDIM	8 - 50	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
	ABOR	8 - 45	X				Clayey, 10-14 in. Ppt zone, sedimentary plains, central	2,364
	RENTSAC	8 - 60	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
282	YAWDIM	25 - 50	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	
	DELPOINT	25 - 45	X				Silty, 10-14 in. Ppt zone, sedimentary plains, central	9,065
	ROCK OUTCROP[1]							
PHILLIPS COUNTY - SSA 641								
30A	MARVAN	0 - 2					Clayey, 10-14 in. Ppt zone, glaciated plains, central	126
37C	EVANSTON	4 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, central	17
81A	GLENDIVE	0 - 2					Silty, 10-14 in. Ppt zone, glaciated plains, central	156
101E	BARKOF	8 - 25					Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	40
	WINDHAM	8 - 25					Silty, limy, 15-19 in. Ppt zone, northern Rocky Mtn. valleys, central	
241B	BENZ	0 - 4					Saline upland, 10-14 in. Ppt zone, glaciated plains, central	45
	VANDA	0 - 4					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	
250E	BASCOVY	8 - 25					Thin clayey, 10-14 in. Ppt zone, sedimentary plains, central	
	NELDORE	8 - 25					Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	382
	WEINGART	8 - 15					Dense clay, 10-14 in. Ppt zone, sedimentary plains, central	
251C	BASCOVY	2 - 8					Clayey, 10-14 in. Ppt zone, sedimentary plains, central	1,529
	NELDORE	2 - 8					Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
301C	MARVAN, SALINE	2 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	38
	MARVAN	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, central	
302B	MARVAN, SALINE	0 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	625
	VANDA	0 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	
322C	KOBASE	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, central	28
	MEGONOT	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, central	
392B	CREED	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	159
	GERDRUM	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
521B	ELLOAM	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	2,030
	ABSHER	0 - 4					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	
563C	SCOBEY	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, central	6
	KEVIN	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, central	
601A	HAVRE	0 - 2					Silty, 10-14 in. Ppt zone, glaciated plains, central	
	HARLAKE	0 - 2					Clayey, 10-14 in. Ppt zone, glaciated plains, central	51
	GLENDIVE	0 - 2					Silty, 10-14 in. Ppt zone, glaciated plains, central	
792C	YAMACALL	2 - 8					Silty, 10-14 in. Ppt zone, glaciated plains, central	14
871B	TAMANEEN	0 - 4				X[3]	Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	6
	DANVERS	0 - 4				X[3]	Clayey, 15-19 in. Ppt zone, northern Rocky Mtn. foothills, central	
925C	SUNBURST	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, central	
	BASCOVY	2 - 8					Clayey, 10-14 in. Ppt zone, glaciated plains, central	557
	WEINGART	2 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	
973E	NELDORE, COOL	8 - 35	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	223
	BASCOVY	8 - 35	X				Thin clayey, 10-14 in. Ppt zone, sedimentary plains, central	
1021E	CABBART	8 - 35	X				Shallow , 10-14 in. Ppt zone, sedimentary plains, central	
	TWILIGHT	8 - 35					Sandy-Steep, 10-14 in. Ppt zone, sedimentary plains, central	2,242
	YAWDIM	8 - 35	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
1052B	ELLOAM	0 - 6					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	152
	THOENY	0 - 6					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	
1059E	WEINGART	4 - 15					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	
	VAEDA	4 - 8					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	50
	BASCOVY	4 - 25	X				Thin clayey, 10-14 in. Ppt zone, glaciated plains, central	
1066D	TWILIGHT	4 - 15					Sandy, 10-14 in. Ppt zone, sedimentary plains, central	
	CABBART	4 - 15					Shallow, 10-14 in. Ppt zone, sedimentary plains, central	677
	MARMARTH	4 - 15					Silty, 10-14 in. Ppt zone, sedimentary plains, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
1090B	HARLAKE	0 - 2					Clayey, 10-14 in. Ppt zone, glaciated plains, central	1,531
	MARVAN	0 - 4					Clayey, 10-14 in. Ppt zone, glaciated plains, central	
1251E	NELDORE	8 - 35	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	8,363
	BASCOVY	8 - 35	X				Thin clayey, 10-14 in. Ppt zone, sedimentary plains, central	
1392B	CREED	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	
	GERDRUM	0 - 4					Clay pan, 10-14 in. Ppt zone, glaciated plains, central	495
	ABSHER	0 - 4					Dense clay, 10-14 in. Ppt zone, glaciated plains, central	
1400F	ROCK OUTCROP[1]							2,066
	ARSITE	8 - 60	X				Saline upland, 10-14 in. Ppt zone, sedimentary plains, central	
1920F	SUNBURST	15 - 45	X				Thin clayey, 10-14 in. Ppt zone, glaciated plains, central	868
	NELDORE	15 - 45	X				Shallow clay, 10-14 in. Ppt zone, glaciated plains, central	
1970F	NELDORE	8 - 60	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
	BASCOVY	8 - 45	X				Thin clayey, 10-14 in. Ppt zone, sedimentary plains, central	1,662
	ROCK OUTCROP[1]							
1971F	YAWDIM	25 - 70	X				Shallow clay, 10-14 in. Ppt zone, sedimentary plains, central	
	CABBART	25 - 70	X				Shallow, 10-14 in. Ppt zone, sedimentary plains, central	6,791
	ROCK OUTCROP[1]							
1973F	NELDORE, MOIST	15 - 60	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	
	NELDORE	15 - 60	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	16,543
	ROCK OUTCROP[1]							
1976F	NELDORE	15 - 60	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	
	PINEBREAKS	15 - 45	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	4,700
	BASCOVY	15 - 45	X				Thin clayey, 10-14 in. Ppt zone, sedimentary plains, central	

Soil Map Unit Symbol	Major Soil Series	Slope Range (%)	Severe Water Erosion Hazard	Severe Wind Erosion Hazard	Hydric Soil	Prime Farmland Soil	Ecological Site	Soil Map Unit Acres
1977F	VOLBORG	15 - 60	X	X			Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	348
	PINEBREAKS	15 - 45	X				Greater than 10% canopy cover (coniferous), 10-14 in. Ppt zone, sedimentary plains, central	

* Ppt = Precipitation
1. Miscellaneous area. Rock outcrop = areas of exposed bedrock.
2. All areas are prime farmland.
3. Prime farmland if irrigated.
4. Prime farmland if drained.

APPENDIX T
Important Vegetation Species Found in Riparian Areas

Graminoids	*Forbs*	*Shrubs*	*Trees*
American Sloughgrass * (Beckmannia syzigachne)	Common Cattail * (Typha latifolia)	Buffalo Currant **** (Ribes odoratum)	Boxelder *** (Acer negundo)
Baltic Rush *** (Juncus balticus)	Curled Dock ** (Rumex crispus)	Common Chokecherry *** (Prunus virginiana)	Green Ash *** (Fraxinus pennsylvanica)
Beaked Sedge * (Carex rostrata)	Horsetail ** (Equisetum spp.)	Red-osier Dogwood ** (Cornus stolonifera)	Narrowleaf Cottonwood ** (Populus angustifolia)
Bluejoint Reedgrass ** (Calamagrostis Canadensis)		Sandbar Willow * (Salix exigua)	Peachleaf Willow ** (Salix amygdaloides)
Creeping Spikesedge * (Eleocharis palustris)		Silver Buffaloberry **** (Shepherdia argentea)	Plains Cottonwood ** (Populus deltoides)
Hardstem Bulrush * (Scirpus acutus)		Yellow Willow ** (Salix lutea)	
Nebraska Sedge * (Carex nebraskensis)			
Nuttall Alkaligrass * (Puccinellia nuttalliana)			
Prairie Bulrush * (Scirpus maritimus)			
Prairie Cordgrass * (Spartina pectinata)			
Reed Canarygrass ** (Phalaris arundinacea)			
Three-square Bulrush * (Scripus pungens)			
Tufted Hair-grass ** (Deschampsia cespitosa)			

* Obligate Wetland – occurs almost always (estimated probability greater than 99%) under natural conditions in wetlands.

** Facultive Wetland – usually occurs in wetlands (estimated probability 67-99%), but occasionally found in non-wetlands.

*** Facultive – equally likely to occur in wetlands or non-wetlands (estimated probability 34-66%).

**** Facultive upland – usually occurs in non-wetlands (estimated probability 67-99%), but occasionally found in wetlands (estimated probability 1-33%) (Hansen et al. 1988).

APPENDIX U
Noxious/Invasive Plant Species at Recreation Sites

		Noxious/Invasive Plant Species																
		Russian knapweed	leafy spurge	Canada thistle	spottted knapweed	hoary cress	perennial pepperweed	poison hemlock	Russian olive	salt cedar	Dalmatian toadflax	purple loosestrife	houndstongue	black henbane	field bindweed	musk/ scotch thistle	burdock	scentless chamomile
Recreation Site	Evans Bend	x	x	x	x										x			x
	Rowe Island	x	x	x	x				x				x		x			
	Senieurs Reach	x		x		x	x	x	x				x				x	x
	Black Bluff Rapids	x	x	x	x		x	x	x				x		x		x	x
	Wood Bottom Boat Ramp	x	x	x	x		x	x	x				x		x		x	x
	Coal Banks Landing	x	x	x			x		x						x			
	Little Sandy	x	x	x	x		x		x						x		x	
	Eagle Creek	x	x	x			x					x						
	Monroe Island	x	x	x	x		x		x		x		x					
	Hole-in-the-Wall	x	x	x	x		x			x	x				x			
	Dark Butte	x	x	x	x		x		x									
	Pablo Rapids	x	x	x	x		x		x					x	x			
	Slaughter River	x	x	x					x									
	The Wall	x	x	x			x											
	Judith Landing	x	x	x	x				x									
	McGarry Bar	x	x	x			x											
	Stafford Ferry	x	x	x	x		x									x		
	Gist Bottom	x	x	x			x		x	x					x	x		
	Cow Island Landing	x	x	x			x											
	Woodhawk Rec. Area	x	x	x	x													
	Hideaway	x	x	x	x				x									
	James Kipp Rec. Area	x	x	x		x									x			

APPENDIX V
Rights-of-Way

Holder	*Right-of-Way No.*	*Type*	*Acres*	*Legal Description*
Ayers, Jim and Pat	M91813 M92390	Road/Waterline Existing Road	1.45 1.20	T25N R11E, sec. 6 T22N R18E, sec. 7
Big Flat Electric Cooperative	M57527	Power Line	1.36	T24N R23E, sec. 5, 6
Blaine County	M90397 B	Ferry Facility	5.37	T23N R18E, sec. 27
BLM Lewistown Field Office	M92760 B M92760 C	Admin Site Admin Site	0.05 0.05	T23N R22E, sec. 12 T22N R18E, sec. 4
Bureau of Reclamation	M014191	Power Line	5.45	T25N R9E, sec. 23
Chouteau County	M78762	Road	9.03	T25N R10E, sec. 18
Devon Energy	M34075	Oil/Gas Pipeline	4.55	T26N R20E, sec. 4, 9
Express Pipeline	M82369	Oil/Gas Pipeline	N/A	T26N R12E, sec. 18
Fergus County	M90397 F	Ferry Facility	1.55	T23N R18E, sec. 27
Fergus Electric Cooperative	M24219 M58077	Power Line Power Line	4.64 5.36	T22N R18E, sec. 3, 4 T23N R18E, sec. 27, 34 T22N R17E, sec. 1, 2 T22N R18E, sec. 6, 9
Hamilton Resources Management	M73490 M79166	Oil/Gas Pipeline Oil/Gas Pipeline	18.82 .73	T25N R19E, sec. 15, 22-25 T26N R20E, sec. 26
Havre Pipeline	M31621	Oil/Gas Pipeline	6.14	T25N R19E, sec. 15, 27, 28
Hill County Electric Cooperative	M59070 M60030	Power Line Power Line	19.02 3.00	T22N R16E, sec. 3, 10 T23N R15E, sec. 30, 31 T23N R16E, sec. 28 T25N R11E, sec. 6 T26N R13E, sec. 29 T26N R21E, sec. 17, 21, 28 T23N R14E, sec. 25
Klabzuba	M41268	Oil/Gas Pipeline	28.85	T23N R18E, sec. 13, 14, 24 T23N R19E, sec. 7, 18, 19, 29, 30

Holder	*Right-of-Way No.*	*Type*	*Acres*	*Legal Description*
Macum Energy	M83688	Oil/Gas Pipeline	25.07	T24N R20E, sec. 12 T25N R20E, sec. 1-3, 11, 14, 23, 26, 35 T25N R21E, sec. 6, 7 T26N R20E, sec. 35
	M89564	Oil/Gas Pipeline	2.45	T25N R20E, sec. 4, 10
	M91713	Oil/Gas Pipeline	13.90	T24N R19E, sec. 21, 22, 23, 24
	M92290	Oil/Gas Road		T24N R20E, sec. 19, 29, 30, 32
	M94141	Oil/Gas Road	12.60	T24N R19E, sec. 22, 23, 24 T24N R20E, sec. 29, 30, 32
			0.75	T25N R20E, sec. 15
Mid-Rivers Telephone Cooperative	M049342	Phone Line	1.82	T22N R24E, sec. 31
	M73508	Comm Site	.11	T23N R22E, sec. 33
Montana Department of Transportation	M013368	Highway	40.00	T22N R24E, sec. 31
	M89978	Secondary Hwy	12.80	T22N R16E, sec. 12
Mothershead Ranch	M93468	Existing Road	0.83	T22N R14E, sec. 13
Triangle Telephone Cooperative	M39347A	Phone Line	13.82	T22N R16E, sec. 3, 10, 14, 15
	M42864	Phone Line	2.73	T24N R23E, sec. 5, 6
	M59069	Phone Line		T25N R23E, sec. 31
			1.41	T25N R10E, sec. 18 T25N R11E, sec. 6
	M40972	Phone Line		T26N R13E, sec. 32
	M94627	Phone Line/Ferry	2.45	T26N R21E, sec. 21, 28
			0.10	T23N R18E, sec. 27
Walling, Tom and Gladys	M91509	Road	.67	T22N R16E, sec. 12

APPENDIX W

Economic Tables Showing Industry Output, Employment, Income, and Income per Job by North American Industrial Classification System (NAICS) Division For the Five Counties in the Study Area

Table W.1
Industry Output, Employment, Income, and Income per Job, by NAICS Division, Blaine County, Montana, 2003 (2005$)

NAICS Division	*Blaine County*			
	Output (Mill. $)	*Employment (Jobs)*	*Income (Mill. $)*	*Income/Job ($)*
Agriculture, Forestry, Fishing, and Hunting	64.0	761	3.9	5,128
Mining	1.4	15	0.6	42,385
Utilities	3.9	11	0.8	77,994
Construction	6.9	80	2.1	26,348
Manufacturing	0.9	6	0.1	18,156
Wholesale Trade	2.5	61	1.1	17,575
Transportation and Warehousing	3.7	46	1.4	30,226
Retail Trade	8.0	194	3.8	19,425
Information	0.8	10	0.1	14,921
Finance and Insurance	5.0	42	1.2	27,535
Real Estate and Rental	0.8	9	0.1	16,306
Services	26.5	872	10.8	12,390
Professional, Scientific, and Tech. Services	2.0	37	0.7	19,822
Management of Companies	0.0	0	0.0	0
Administrative and Waste Services	0.7	20	0.1	2,594
Educational Services	0.8	35	0.5	14,226
Health and Social Services	10.0	272	5.2	19,300
Arts, Entertainment, and Recreation	0.7	23	0.2	9,738
Accommodation and Food Services	3.8	111	1.1	9,478
Other Services	8.5	373	3.0	8,006
Government and Non NAICS	50.2	853	36.0	42,242
Totals	174.7	2,960	62.1	20,979

Source: 2003 IMPLAN data from Minnesota IMPLAN Group, Inc.

Table W.2
Industry Output, Employment, Income, and Income per Job, by NAICS Division, Chouteau County, Montana, 2003 (2005$)

NAICS Division	*Chouteau County*			
	Output (Mill. $)	*Employment (Jobs)*	*Income (Mill. $)*	*Income/Job ($)*
Agriculture, Forestry, Fishing, and Hunting	68.8	1,485	11.3	7,598
Mining	0.0	0	0.0	0
Utilities	5.6	7	1.3	194,371
Construction	4.4	57	1.1	20,093
Manufacturing	8.2	42	0.7	17,231
Wholesale Trade	5.2	72	2.2	30,792
Transportation and Warehousing	1.3	21	0.7	31,279
Retail Trade	7.7	167	3.7	21,931
Information	3.8	24	1.3	52,655
Finance and Insurance	3.2	40	1.0	25,246
Real Estate and Rental	47.4	275	8.4	30,403
Services	31.0	970	11.5	11,806
Professional, Scientific, and Tech. Services	2.1	36	0.7	20,017
Management of Companies	0.0	0	0.0	0
Administrative and Waste Services	2.9	96	1.1	11,793
Educational Services	0.0	6	0.0	0
Health and Social Services	8.6	198	4.4	22,159
Arts, Entertainment, and Recreation	1.1	24	0.3	13,937
Accommodation and Food Services	5.6	164	1.4	8,639
Other Services	10.6	445	3.5	7,761
Government and Non NAICS	30.2	466	14.5	31,040
Totals	217.0	3,624	57.6	15,879

Source: 2003 IMPLAN data from Minnesota IMPLAN Group, Inc.

Table W.3
Industry Output, Employment, Income, and Income per Job, by NAICS Division, Fergus County, Montana, 2003 (2005$)

NAICS Division	*Fergus County*			
	Output (Mill. $)	*Employment (Jobs)*	*Income (Mill. $)*	*Income/Job ($)*
Agriculture, Forestry, Fishing, and Hunting	77.9	1,231	6.4	5,181
Mining	5.5	11	3.2	274,984
Utilities	14.1	35	3.0	85,228
Construction	68.5	676	24.8	36,689
Manufacturing	64.3	320	9.2	28,720
Wholesale Trade	16.8	227	7.2	31,520
Transportation and Warehousing	7.4	84	3.4	40,538
Retail Trade	40.6	758	19.1	25,124
Information	4.7	43	0.8	18,800
Finance and Insurance	22.2	191	5.6	29,294
Real Estate and Rental	15.9	104	2.5	24,436
Services	102.4	2,353	40.4	17,186
Professional, Scientific, and Tech. Services	12.3	224	5.7	25,527
Management of Companies	0.3	3	0.1	0
Administrative and Waste Services	3.4	83	1.0	12,182
Educational Services	0.2	29	0.0	0
Health and Social Services	38.3	643	18.5	28,820
Arts, Entertainment, and Recreation	4.2	104	1.4	13,605
Accommodation and Food Services	18.3	508	5.2	10,243
Other Services	25.5	759	8.5	11,205
Government and Non NAICS	70.5	1,030	39.8	38,681
Totals	510.9	7,063	165.3	23,406

Source: 2003 IMPLAN data from Minnesota IMPLAN Group, Inc.

Table W.4
Industry Output, Employment, Income, and Income per Job, by NAICS Division, Hill County, Montana, 2003 (2005$)

NAICS Division	*Hill County*			
	Output (Mill. $)	*Employment (Jobs)*	*Income (Mill. $)*	*Income/Job ($)*
Agriculture, Forestry, Fishing, and Hunting	54.2	1,150	6.9	5,999
Mining	25.8	111	5.5	49,495
Utilities	13.8	24	3.2	130,296
Construction	34.5	396	10.5	26,506
Manufacturing	16.3	93	2.5	27,303
Wholesale Trade	19.6	279	8.3	29,769
Transportation and Warehousing	101.3	537	36.3	67,605
Retail Trade	49.1	1,008	23.5	23,347
Information	30.8	154	7.9	51,213
Finance and Insurance	31.0	313	9.2	29,391
Real Estate and Rental	18.8	150	3.6	24,087
Services	166.5	3,802	65.8	17,305
Professional, Scientific, and Tech. Services	20.5	317	9.8	30,835
Management of Companies	0.0	0	0.0	0
Administrative and Waste Services	6.5	142	2.5	17,489
Educational Services	4.2	158	2.5	15,619
Health and Social Services	65.3	1,198	27.9	23,316
Arts, Entertainment, and Recreation	7.1	171	2.3	13,405
Accommodation and Food Services	28.8	761	8.5	11,179
Other Services	34.2	1,055	12.3	11,697
Government and Non NAICS	130.3	2,014	78.8	39,145
Totals	692.1	10,030	262.0	26,121

Source: 2003 IMPLAN data from Minnesota IMPLAN Group, Inc.

Table W.5
Industry Output, Employment, Income, and Income per Job, by NAICS Division, Phillips County, Montana, 2003 (2005$)

NAICS Division	*Phillips County*			
	Output (Mill. $)	*Employment (Jobs)*	*Income (Mill. $)*	*Income/Job ($)*
Agriculture, Forestry, Fishing, and Hunting	54.1	827	5.6	6,738
Mining	10.5	18	1.9	103,491
Utilities	7.4	19	1.1	57,820
Construction	9.8	121	2.7	22,040
Manufacturing	8.2	35	0.8	21,919
Wholesale Trade	8.8	102	3.7	36,877
Transportation and Warehousing	19.8	93	4.4	47,218
Retail Trade	7.3	190	3.4	17,793
Information	1.4	15	0.2	15,843
Finance and Insurance	8.0	52	2.1	40,192
Real Estate and Rental	3.1	18	0.5	28,293
Services	30.6	853	10.9	12,815
Professional, Scientific, and Tech. Services	3.3	39	1.0	24,381
Management of Companies	0.0	0	0.0	0
Administrative and Waste Services	1.6	58	0.5	8,714
Educational Services	0.0	1	0.0	13,252
Health and Social Services	8.1	225	4.4	19,786
Arts, Entertainment, and Recreation	1.7	36	0.6	15,595
Accommodation and Food Services	4.5	142	1.2	8,699
Other Services	11.4	352	3.2	9,129
Government and Non NAICS	25.8	419	14.8	35,279
Totals	194.8	2,761	52.1	18,852

Source: 2003 IMPLAN data from Minnesota IMPLAN Group, Inc.

APPENDIX X

U.S. Fish and Wildlife Service Concurrence

United States Department of the Interior
FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES
MONTANA FIELD OFFICE
100 N. PARK, SUITE 320
HELENA, MONTANA 59601
PHONE (406) 449-5225, FAX (406) 449-5339

FM	SS
ASSOCIATE FM	PAO
RESOURCES	LE
MONUMENT	HAVRE
FIRE	FORT BENTON
OTHER	

USDI-BLM LEWISTOWN FIELD OFFICE
RECEIVED
JAN 27 2006

Action
Coord w/
Biol
Copies for

M.02 - BLM

January 16, 2006

Memorandum

To: Field Manager, Bureau of Land Management, Lewistown Field Office, Lewistown, Montana

From: Field Supervisor, U.S. Fish and Wildlife Service, Montana Field Office, Helena, Montana R. Mark Wilson

Subject: Upper Missouri River Breaks National Monument Draft Resource Management Plan and Environmental Impact Statement Biological Assessment

This is in response to your December 13, 2005 letter, received by the U.S. Fish and Wildlife Service (Service) on December 14, 2006 transmitting the biological assessment for the proposed Missouri River Breaks National Monument Draft Resource Management Plan which assess effects on the bald eagle (*Haliaeetus leucocephalus*), black-footed ferret (*Mustela nigripes*), and pallid sturgeon (*Scaphirhynchus albus*) on Bureau of Land Management (BLM) lands within the Upper Missouri River Breaks National Monument. The proposed plan will guide all BLM activities on these lands for approximately the next 15 years.

In your biological assessment you determined that the Missouri River Breaks National Monument Draft Resource Management Plan may affect, but is not likely to adversely affect the bald eagle, black-footed ferret, and pallid sturgeon. You have also determined that the project will have no effect on the endangered gray wolf, threatened grizzly bear, threatened Canada lynx, and threatened piping plover. When BLM makes a "no effect" determination, concurrence from the Service is not required, but we do appreciate having the information for our records.

The Service concurs with the determination of may affect, not likely to adversely affect the bald eagle, black-footed ferret, and pallid sturgeon. The Service bases this concurrence on information displayed in the biological assessment, supporting documentation obtained during meetings with your staff and cooperators, and numerous discussions and correspondences with BLM personnel. We view several conservation measures included in your proposal to be important to ensure that adverse effects to listed species do not occur, among these are:

- Your commitment to allowing no new construction activities within ½ mile of bald eagle nests
- Your commitment to manage bald eagles according to the Montana Bald Eagle Management plan of 1994
- Your commitment to require that all new power line right-of-way permits will stipulate

that raptor safe construction, as outlined in Avian Power Line Interaction Committee (1996), is required for new above-ground power lines

- Your commitment to survey for black-footed ferrets prior to ground disturbing activities occurring on any portion of prairie dog complexes over 80 acres in area

With strict adherence to these conservation measures, and other project design features contained in your biological assessment and draft environmental impact statement, we anticipate no adverse effects to bald eagles, black-footed ferrets, and pallid sturgeon will result from activities authorized by the proposed resource management plan.

This concludes informal consultation pursuant to regulation 50 CFR Part 402, Interagency Cooperation-Endangered Species Act of 1973, as Amended. This project should be reanalyzed if new information reveals additional effects of the action that may impact listed species or if the project is modified in a manner that causes an effect not considered in this consultation.

The Service recognizes and values the ongoing effort by the Lewistown Field Office to conserve native species and move threatened species toward recovery. We also appreciate your participation on the Level 1 and Level 2 teams.

If you have further questions about this letter or your responsibilities under the Endangered Species Act, please contact me or Shawn Sartorius of my staff at 406-247-7369.

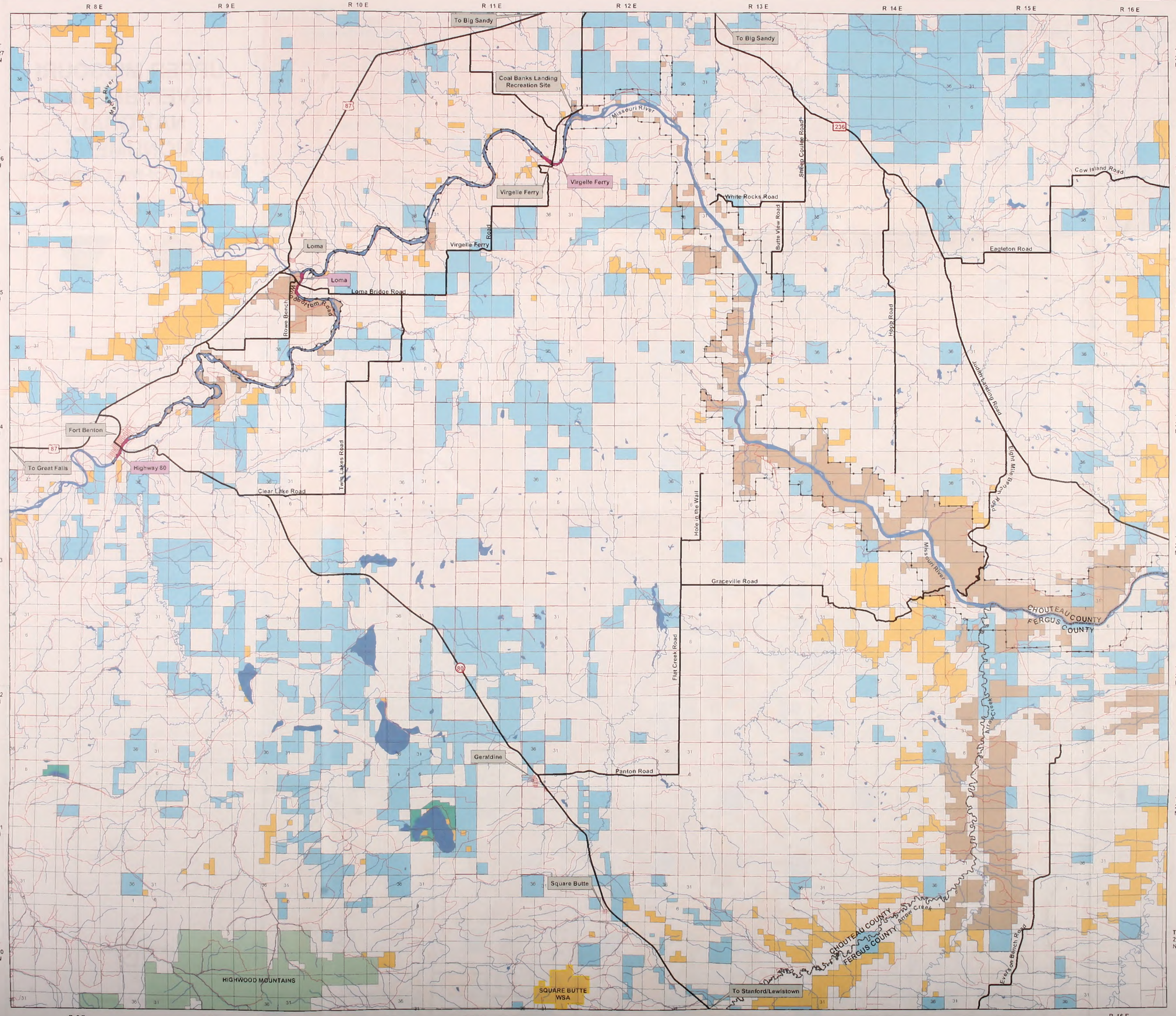
BLM LIBRARY
BLDG 50, ST-150A
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225

GPO U.S. GOVERNMENT PRINTING OFFICE: 2008 — 760-100 / 38013 Region No. 8

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

West Right-of-Way Corridor Map

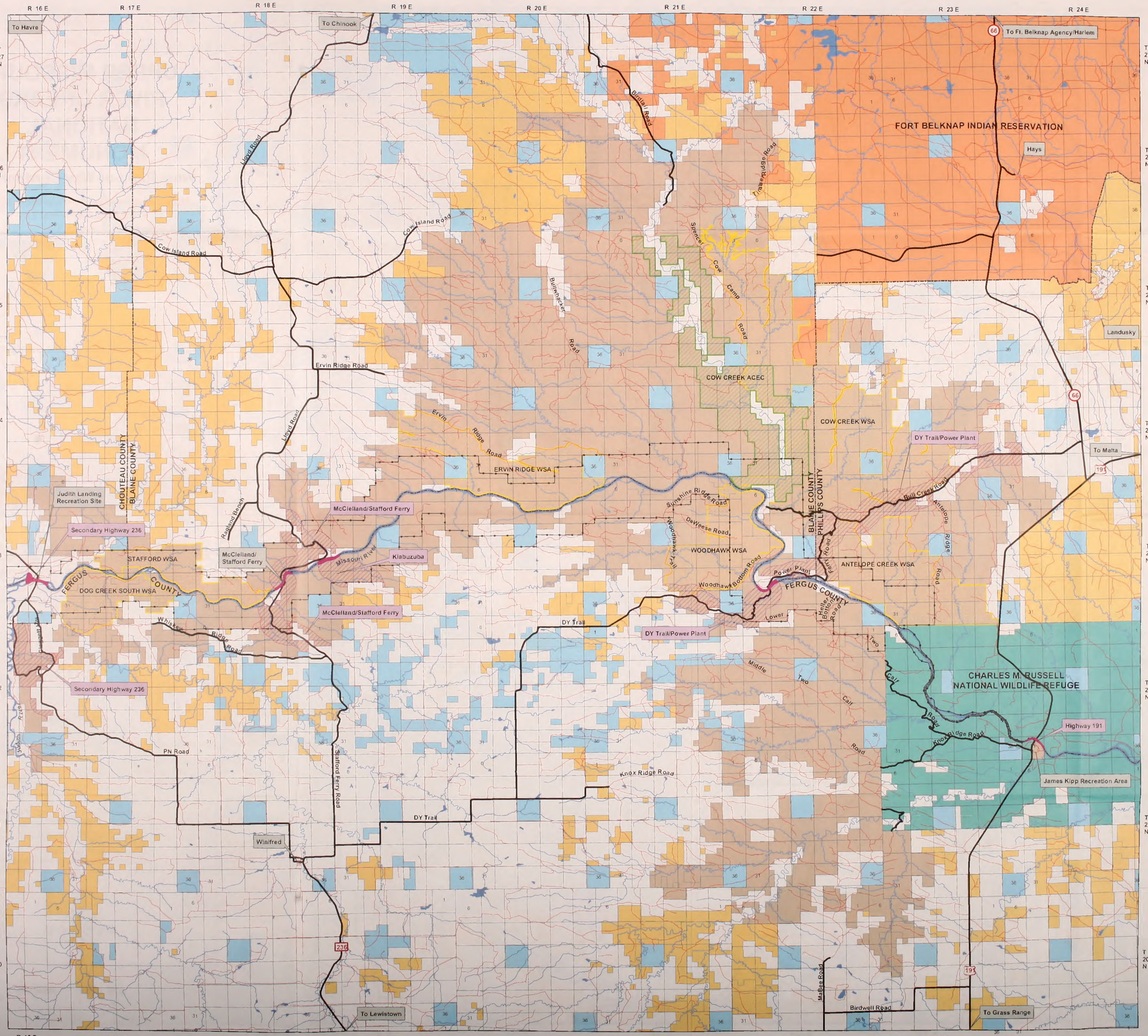
Map 1 - Alternative F (Preferred) - Side A
Proposed RMP/Final EIS



UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

East Right-of-Way Corridor Map

Map 1 - Alternative F (Preferred) - Side B
Proposed RMP/Final EIS



Legend

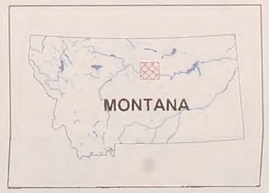
- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- County Boundary
- Right-of-Way Corridors River
- Right-of-Way Corridors BLM Land

Surface Ownership

- National Monument (BLM)
- Other BLM
- Indian Land or Reservation
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

- County Roads, Highways, and CMR National Wildlife Refuge Roads or Other Main Public Roads



Disclaimer

Base data derived from USGS digital and mylar 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008.

The map projection is in Albers; the data is in NAD 27; and the units are in meters.

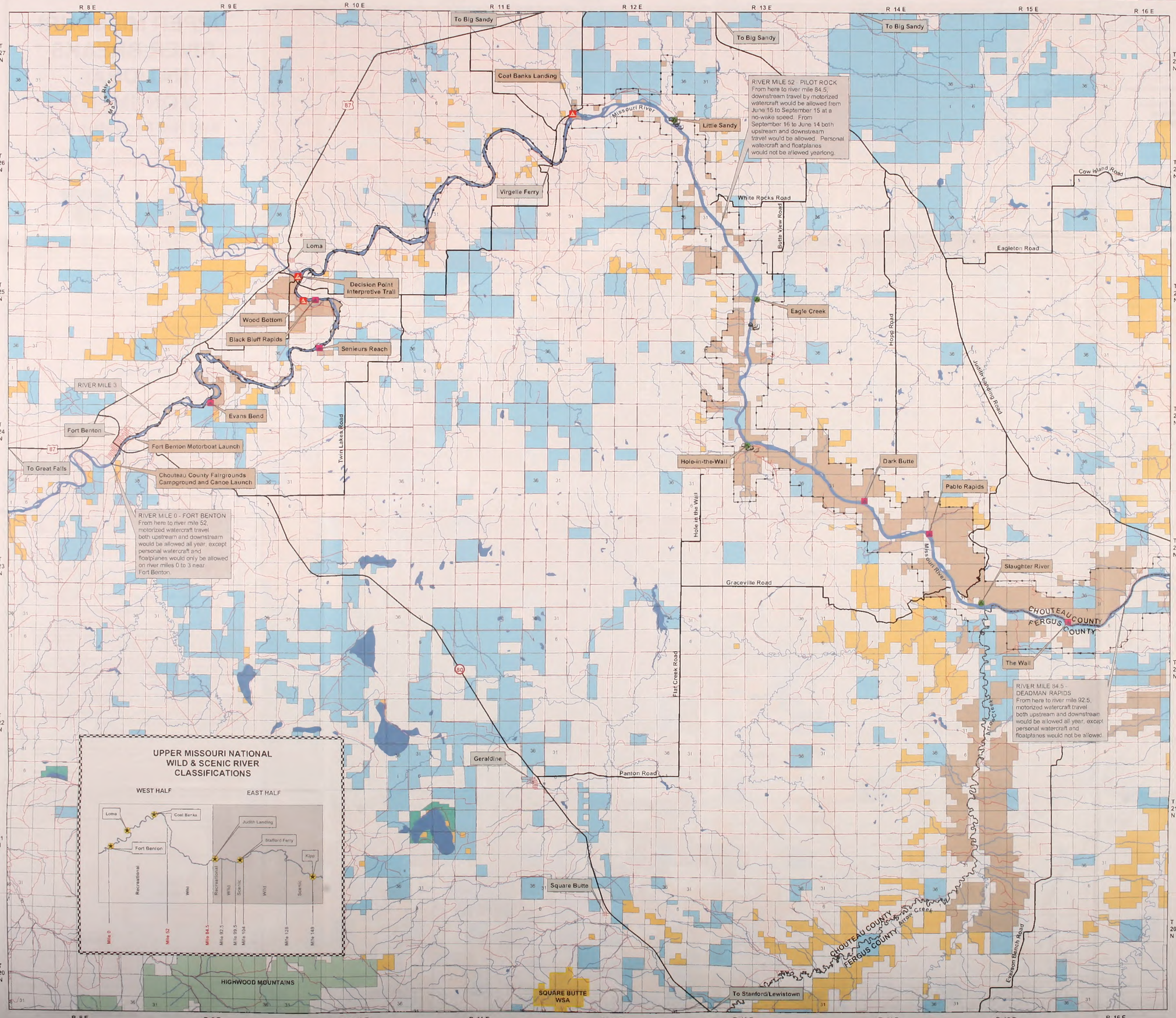
N W E S

0 0.5 1 2 3 4 Miles

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

West Half Recreation Map

Map 2 - Side A
Proposed RMP/Final EIS



Legend

- Wild & Scenic River Boundary
- Wilderness Study Area
- County Boundary

Surface Ownership

- National Monument (BLM)
- Other BLM
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

- Potential Geological Interpretive Sites

- Level 1 - Developed Public Access Sites
- Level 2 - Developed Upland Sites or Boat Camps
- Level 3 - Primitive Camp Sites or Boat Camps

Upland Recreation Facilities

Level 1 – Developed Public Access Sites. Recreation sites where a high level of infrastructure development could include campsites, parking lots, vault toilets, interpretive signs, campground host facilities, tree plantings, picnic tables, waste facilities and other infrastructure improvements that accommodate the transition from highway to collector roads. Sites would be marked on a map.

Level 2 – Developed Upland Sites. Campsites, trailheads, scenic overlooks and reservoirs where moderate levels of infrastructure development could include metal fire rings, vault toilets, and improved gravel parking areas. Interpretive signs and information boards may be present but would be much less obtrusive than at Level 1 sites and would blend well with natural surroundings. Sites would be marked on a map.

Level 3 – Primitive Campsites. Pull-out sites immediately adjacent to a road. They contain a fire ring and may include minimal signing, but no other infrastructure.

Level 4 – Dispersed Camping Opportunities. Public land in a natural state used for dispersed, undeveloped camping. These areas may be accessible by motorized or non-motorized travel. No infrastructure would be present.

River Recreation Facilities

Level 1 – Developed public access sites. These sites are accessible by road with a full range of developments that could include parking lots, boat ramps, vault toilets, campsites for tents and RVs and picnic facilities.

Level 2 – Developed boat camps. These sites are accessible to the public only by boat. The sites could include vault toilets, metal fire rings and occasionally open-air shelters.

Level 3 – Primitive boat camps. These sites are accessible only by boat and could contain a metal fire ring. There are no other developments.

Level 4 – Dispersed camping opportunities. In addition to the developed sites described above, camping is permissible on any of the 90,000 acres of BLM land adjacent to the river. The absence of development allows opportunities for those seeking a completely primitive experience.

Disclaimer

Base data derived from USGS digital and paper 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008

The map projection is in Albers; the data is in NAD 27, and the units are in meters.

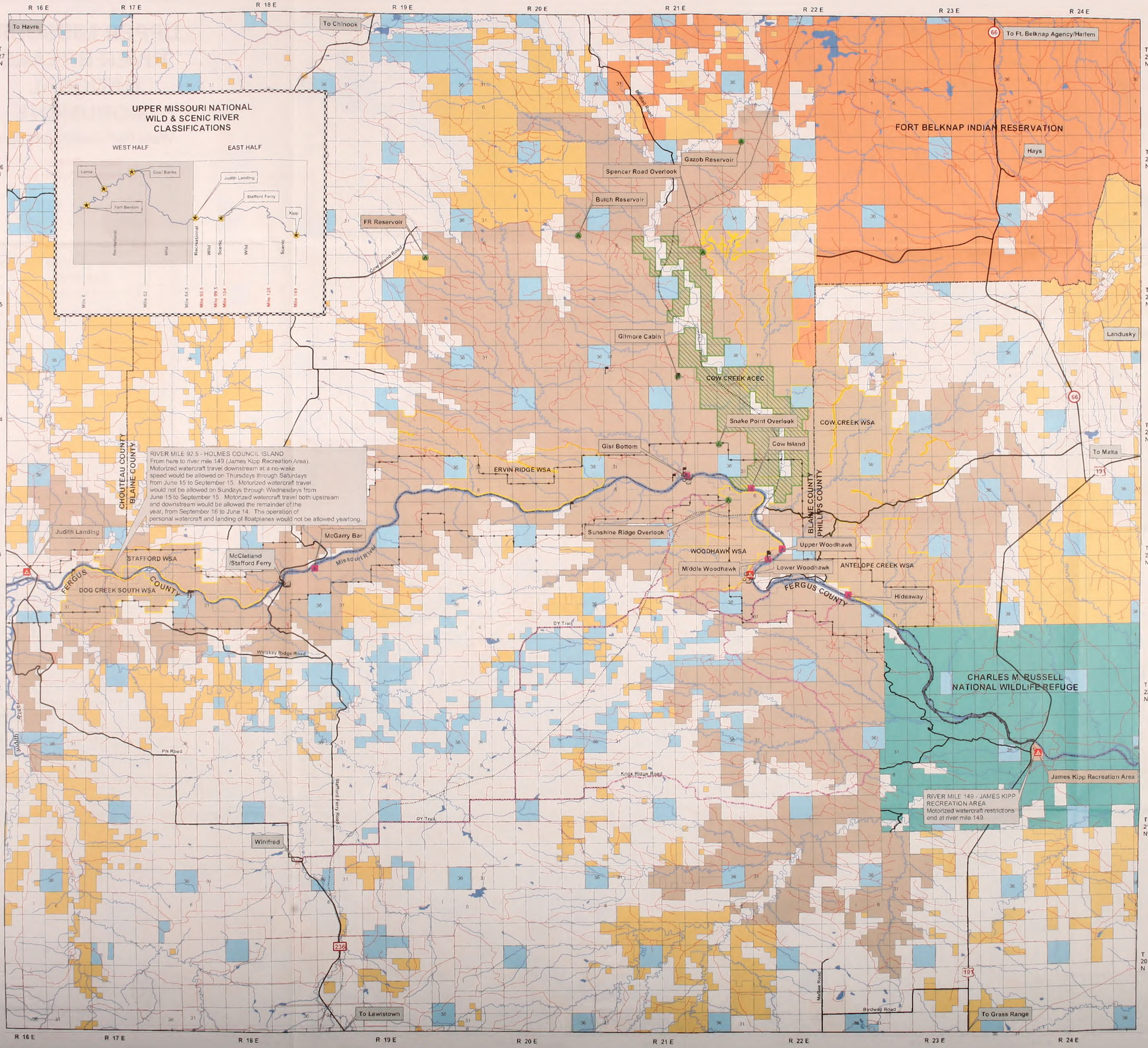
N W E S

0 0.5 1 2 3 4 Miles

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

East Half Recreation Map

Map 2 - Side B
Proposed RMP/Final EIS



Legend

- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- County Boundary

Surface Ownership

- National Monument (BLM)
- Other BLM
- Indian Land or Reservation
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

- Missouri Breaks Back Country Byway
- Nez Perce National Historic Trail
- Potential Cultural Interpretive Sites
- Potential Geological Interpretive Sites

- Level 1 - Developed Public Access Sites
- Level 2 - Developed Upland Sites or Boat Camps
- Level 3 - Primitive Camp Sites or Boat Camps

Upland Recreation Facilities

Level 1 - Developed Public Access Sites. Recreation sites where a high level of infrastructure development could include campsites, parking lots, vault toilets, interpretive signs, campground host facilities, tree plantings, picnic tables, waste facilities and other infrastructure improvements that accommodate the transition from highway to collector roads. Sites would be marked on a map.

Level 2 - Developed Upland Sites. Campsites, trailheads, scenic overlooks and reservoirs where moderate levels of infrastructure development could include metal fire rings, vault toilets, and improved gravel parking areas. Interpretive signs and information boards may be present but would be much less obtrusive than at Level 1 sites and would blend well with natural surroundings. Sites would be marked on a map.

Level 3 - Primitive Campsites. Pull-out sites immediately adjacent to a road. They contain a fire ring and may include minimal signing, but no other infrastructure.

Level 4 - Dispersed Camping Opportunities. Public land in a natural state used for dispersed, undeveloped camping. These areas may be accessible by motorized or non-motorized travel. No infrastructure would be present.

River Recreation Facilities

Level 1 - Developed public access sites. These sites are accessible by road with a full range of developments that could include parking lots, boat ramps, vault toilets, campsites for tents and RVs and picnic facilities.

Level 2 - Developed boat camps. These sites are accessible to the public only by boat. The sites could include vault toilets, metal fire rings and occasionally open-air shelters.

Level 3 - Primitive boat camps. These sites are accessible only by boat and could contain a metal fire ring. There are no other developments.

Level 4 - Dispersed camping opportunities. In addition to the developed sites described above, camping is permissible on any of the 90,000 acres of BLM land adjacent to the river. The absence of development allows opportunities for those seeking a completely primitive experience.

Disclaimer

Base data derived from USGS digital and map 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2006

The map projection is in Albers; the data is in NAD 27, and the units are in meters.

N W E S

0 0.5 1 2 3 4 Miles

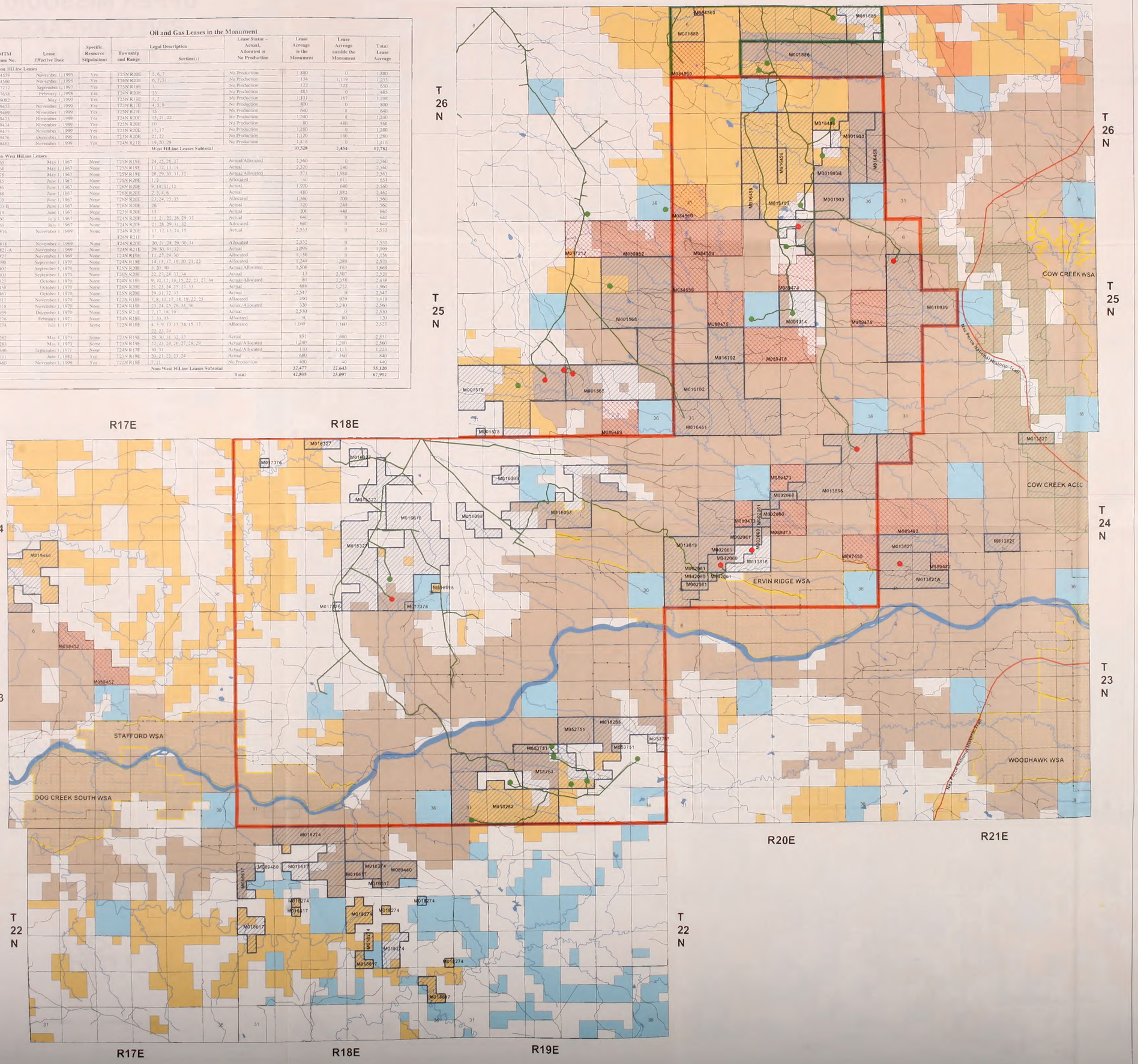
UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

Oil and Gas Map

Map 3 - Side A
Proposed RMP/Final EIS

Oil and Gas Leases in the Monument

MTM Lease No.	Lease Effective Date	Specific Resource Stipulations	Legal Description: Township and Range	Legal Description: Section(s)	Lease Status – Actual, Allocated or No Production	Lease Acreage in the Monument	Lease Acreage outside the Monument	Total Lease Acreage
West HiLine Leases								
084559	November 1, 1995	Yes	T25N R20E	5, 6, 7	No Production	1,880	0	1,880
084560	November 1, 1995	Yes	T26N R20E	6, 7, 31	No Production	134	1,119	1,253
087212	September 1, 1997	Yes	T25N R19E	3	No Production	122	528	650
087658	February 1, 1998	Yes	T24N R20E	25	No Production	485	0	485
089082	May 1, 1999	Yes	T25N R19E	1, 2	No Production	1,431	167	1,598
089452	November 1, 1999	Yes	T23N R17E	4, 5, 9	No Production	800	0	800
089469	November 1, 1999	Yes	T25N R19E	35	No Production	640	0	640
089473	November 1, 1999	Yes	T24N R20E	15, 21, 22	No Production	1,240	0	1,240
089474	November 1, 1999	Yes	T25N R20E	10	No Production	80	480	560
089475	November 1, 1999	Yes	T23N R20E	13, 17	No Production	1,280	0	1,280
089476	December 1, 1999	Yes	T23N R20E	21, 22	No Production	1,120	160	1,280
089482	November 1, 1999	Yes	T24N R21E	19, 20, 29	No Production	1,416	0	1,416
				West HiLine Leases Subtotal		10,328	2,454	12,782
Non-West HiLine Leases								
1565	May 1, 1967	None	T25N R19E	24, 25, 26, 27	Actual/Allocated	2,560	0	2,560
1568	May 1, 1967	None	T25N R19E	11, 12, 13, 14	Actual	2,320	240	2,560
1578	May 1, 1967	None	T25N R19E	28, 29, 30, 31, 32	Actual/Allocated	575	1,988	2,563
1883	June 1, 1967	None	T26N R20E	1, 2	Allocated	40	611	651
1886	June 1, 1967	None	T26N R20E	9, 10, 11, 12	Actual	1,920	640	2,560
1888	June 1, 1967	None	T26N R20E	2, 3, 4, 6	Actual	480	1,982	2,462
1903	June 1, 1967	None	T26N R20E	23, 24, 25, 35	Allocated	1,360	200	1,560
1903-B	June 1, 1967	None	T26N R20E	26	Actual	320	240	560
1914	June 1, 1967	None	T25N R20E	15	Actual	200	440	640
2060	July 1, 1967	None	T24N R20E	15, 21, 22, 28, 29, 32	Actual	640	0	640
2061	July 1, 1967	None	T24N R20E	21, 28, 29, 31, 32	Allocated	640	0	640
13816	November 1, 1969	None	T24N R20E	11, 12, 13, 14, 15	Actual	2,533	0	2,533
			T24N R21E	7				
13818	November 1, 1969	None	T24N R20E	20, 21, 28, 29, 30, 31	Allocated	2,532	0	2,532
13821-A	November 1, 1969	None	T24N R21E	29, 30, 31, 32	Actual	1,099	0	1,099
13827	November 1, 1969	None	T24N R19E	11, 27, 29, 30	Allocated	1,156	0	1,156
16098	September 1, 1970	None	T25N R19E	14, 15, 17, 19, 20, 21, 22	Allocated	1,240	1,280	2,520
16102	September 1, 1970	None	T25N R20E	3, 20, 30	Actual/Allocated	1,506	163	1,669
16103	September 1, 1970	None	T26N R20E	22, 27, 28, 33, 34	Actual	13	2,507	2,520
16327	October 1, 1970	None	T24N R18E	9, 10, 13, 14, 15, 22, 23, 27, 34	Actual/Allocated	80	2,358	2,438
16458	October 1, 1970	None	T26N R20E	21, 23, 24, 25, 27, 33	Actual	688	1,272	1,960
16461	October 1, 1970	None	T25N R20E	29, 31, 32, 33	Actual	2,547	0	2,547
16617	November 1, 1970	None	T22N R18E	7, 8, 10, 17, 18, 19, 22, 25	Allocated	490	929	1,419
16618	November 1, 1970	None	T24N R18E	23, 24, 25, 26, 35, 36	Actual/Allocated	320	2,240	2,560
16619	December 1, 1970	None	T25N R21E	7, 17, 18, 19	Actual	2,530	0	2,530
17376	February 1, 1971	None	T24N R18E	7, 33, 35	Allocated	41	80	120
18274	July 1, 1971	Some	T22N R18E	4, 5, 9, 10, 13, 14, 15, 17, 22, 23, 24	Allocated	1,160	1,160	2,527
				29, 30, 31, 32, 33				
18282	May 1, 1973	Some	T21N R19E	29, 30, 31, 32, 33	Actual	851	1,680	2,531
18283	May 1, 1973	Some	T23N R19E	22, 23, 24, 26, 27, 28, 29	Actual/Allocated	1,240	1,280	2,560
19446	September 1, 1971	None	T24N R17E	30, 31	Actual/Allocated	110	1,113	1,223
53751	June 1, 1982	Yes	T23N R19E	20, 21, 22, 23, 24	Actual	680	160	840
89460	November 1, 1999	Yes	T22N R18E	4	No Production	400	40	440
				Non-West HiLine Leases Subtotal		32,477	22,643	55,120
					Total	42,805	25,097	67,902



Legend

- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- Nez Perce National Historic Trail

Surface Ownership

- National Monument (BLM)
- Other BLM
- Indian Land or Reservation
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

Natural Gas Fields/Leases

- Sawtooth Mountain Gas Field
- Leroy Gas Field
- Natural Gas Pipeline
- Active Wells in the Monument
- Active Wells 1/2 mile outside the Monument
- West HiLine Leases
- Non-West HiLine Leases

Disclaimer

Base data derived from USGS digital and mylar 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008.

The map projection is in Albers; the data is in NAD 27; and the units are in meters.

N W E S

Miles
0 0.3 0.6 1.2 1.8 2.4

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

Reasonable Forseeable Development

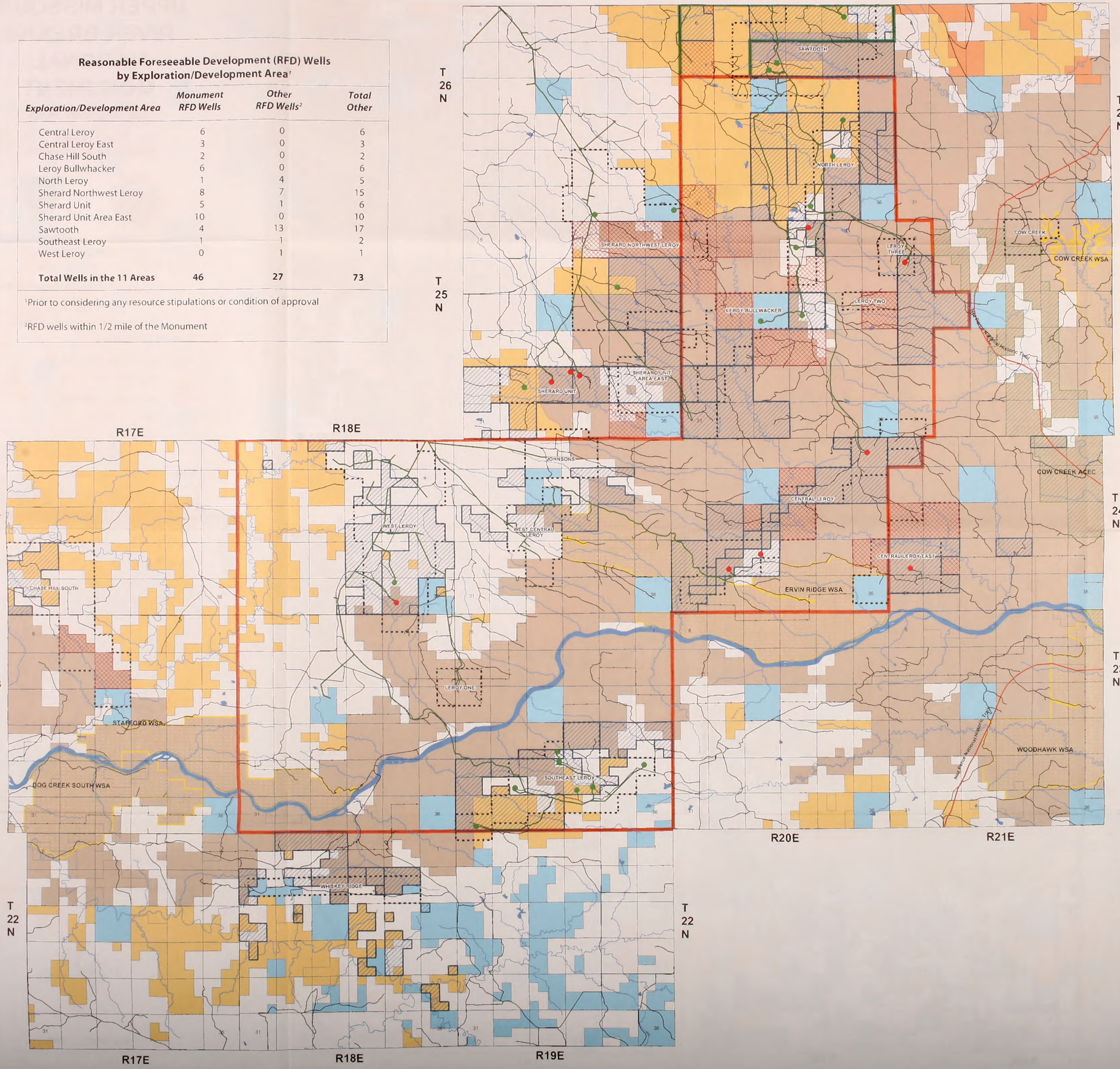
Map 3 - Side B
Proposed RMP/Final EIS

Reasonable Foreseeable Development (RFD) Wells by Exploration/Development Area[1]

Exploration/Development Area	*Monument RFD Wells*	*Other RFD Wells[2]*	*Total Other*
Central Leroy	6	0	6
Central Leroy East	3	0	3
Chase Hill South	2	0	2
Leroy Bullwhacker	6	0	6
North Leroy	1	4	5
Sherard Northwest Leroy	8	7	15
Sherard Unit	5	1	6
Sherard Unit Area East	10	0	10
Sawtooth	4	13	17
Southeast Leroy	1	1	2
West Leroy	0	1	1
Total Wells in the 11 Areas	**46**	**27**	**73**

[1]Prior to considering any resource stipulations or condition of approval

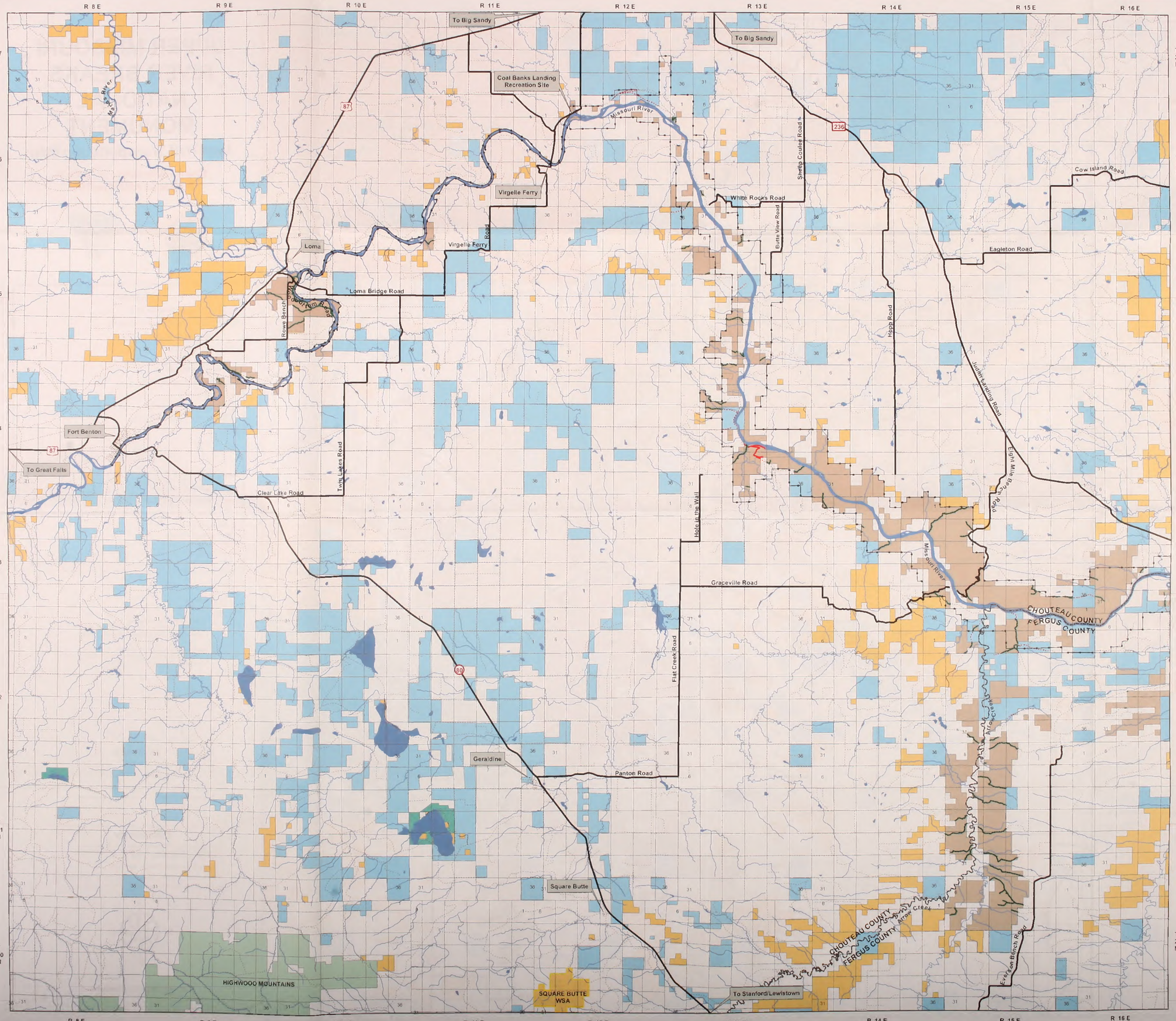
[2]RFD wells within 1/2 mile of the Monument



UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

West Half Transportation Map

Map 4 - Alternative A - Side A
Proposed RMP/Final EIS



Legend

- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- County Boundary

Surface Ownership

- National Monument (BLM)
- Other BLM
- U.S Forest Service
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

- County Roads, Highways, and CMR National Wildlife Refuge Roads or Other Main Public Roads
- State Roads
- Open State Land Roads

BLM Road System

- Open BLM Roads
- Closed BLM Roads
- Limited BLM Roads
- "Landowner Permission may be Required for Access to BLM Roads"

Disclaimer

Base data derived from USGS digital and mylar 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008.

The map projection is in Albers; the data is in NAD 27; and the units are in meters.

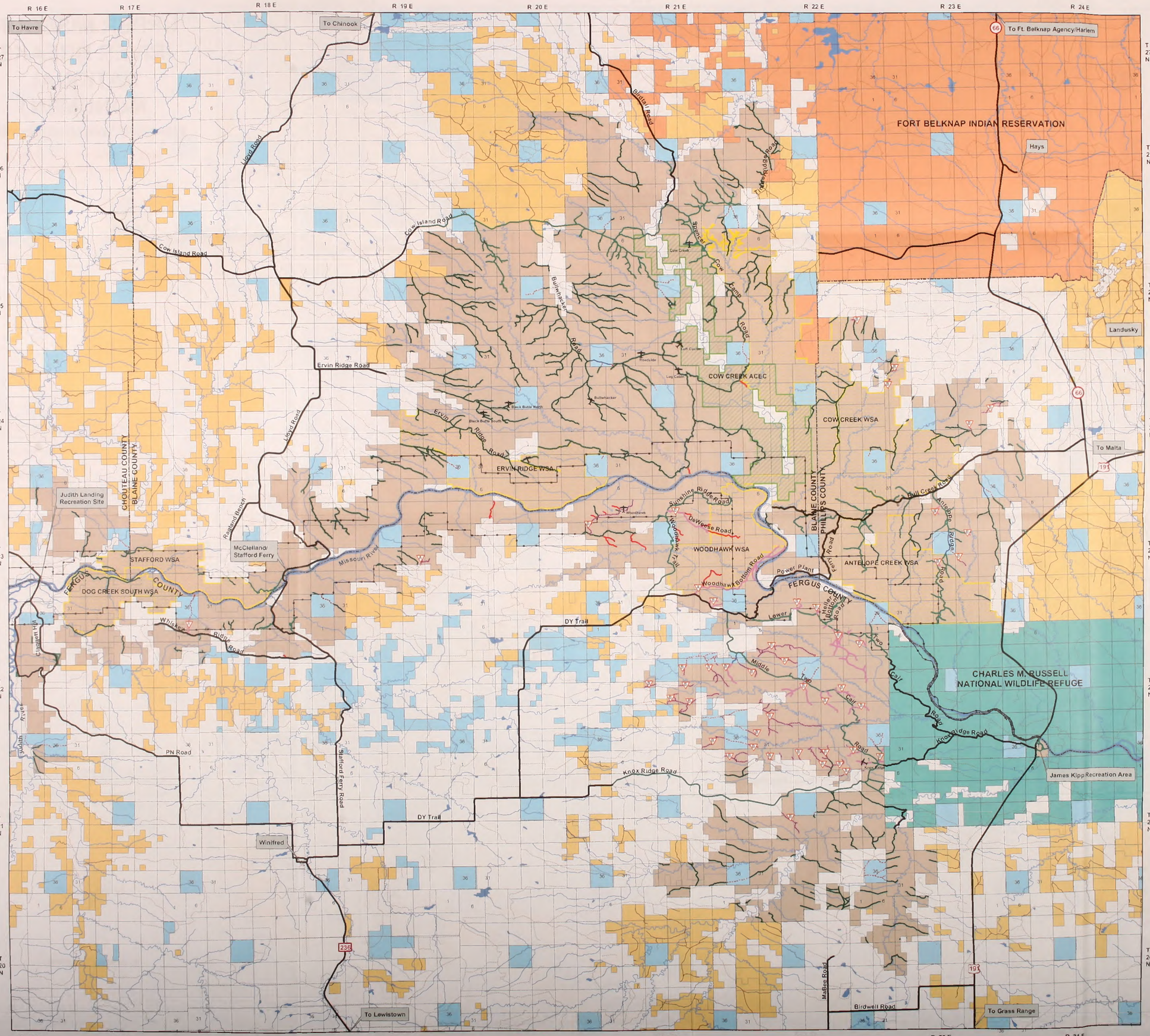
N W E S

0 0.5 1 2 3 4 Miles

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

East Half Transportation Map

Map 4 - Alternative A - Side B
Proposed RMP/Final EIS



Legend

- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- County Boundary

Surface Ownership

- National Monument (BLM)
- Other BLM
- Indian Land or Reservation
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

- County Roads, Highways, and CMR National Wildlife Refuge Roads or Other Main Public Roads
- Open State Land Roads
- Closed State Land Roads
- Backcountry Airstrips

BLM Road System

- Open BLM Roads
- Closed BLM Roads
- Limited BLM Roads
- "Landowner Permission may be Required for Access to BLM Roads"

Limited BLM Road Designation

- Open April 16 to November 30 (Closed December 1 to April 15-Big Game Winter Range and Bighorn Sheep Habitat)
- Open December 2 to August 31 (Closed September 1 to December 1, Game retrieval allowed on most roads)

Disclaimer

Base data derived from USGS digital and mylar 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008

The map projection is in Albers; the data is in NAD 27; and the units are in meters

N
W E
S

0 0.5 1 2 3 4 Miles

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

West Half Transportation Map

Map 5 - Alternative F (Preferred) - Side A
Proposed RMP/Final EIS

Legend

- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- County Boundary

Surface Ownership

- National Monument (BLM)
- Other BLM
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

- County Roads, Highways, and CMR National Wildlife Refuge Roads or Other Main Public Roads
- Open State Land Roads
- Closed State Land Roads
- Backcountry Airstrips

BLM Road System

- Open BLM Roads
- Closed BLM Roads
- Limited BLM Roads
- "Landowner Permission may be Required for Access to BLM Roads"

Limited BLM Road Designations

Open April 1 to November 30
(Closed December 1 to March 31 - Big Game Winter Range)

MONTANA

Disclaimer

Base data derived from USGS digital and mylar 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008

The map projection is in Albers; the data is in NAD 27; and the units are in meters.

N W E S

0 0.5 1 2 3 4 Miles

R 8 E R 9 E R 10 E R 11 E R 12 E R 13 E R 14 E R 15 E R 16 E

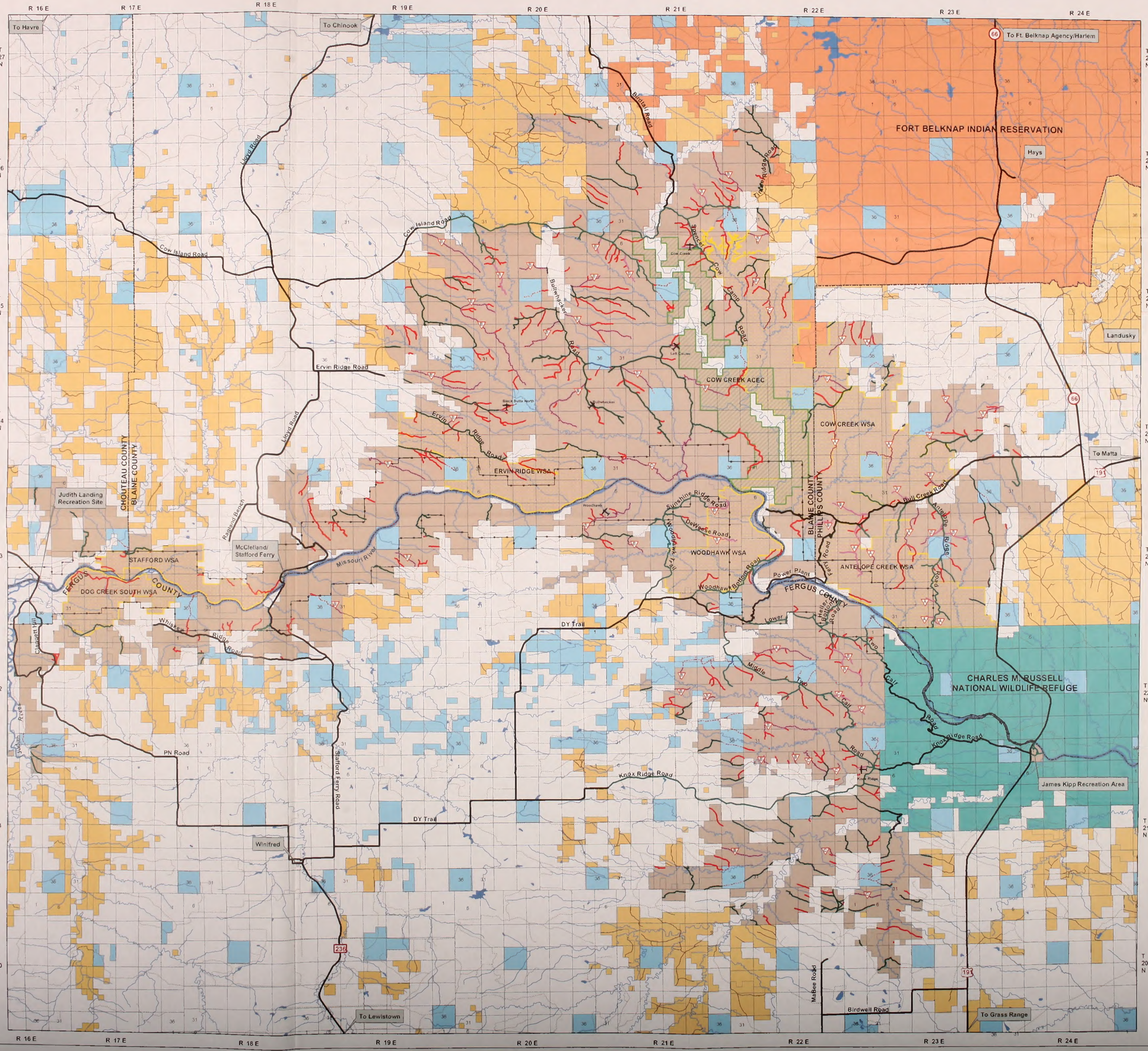
T 27 N T 26 N T 25 N T 24 N T 23 N T 22 N T 21 N T 20 N

To Big Sandy
Coal Banks Landing Recreation Site
Missouri River
Virgelle Ferry
Virgelle Ferry Road
Loma
Loma Bridge Road
Rowe Bench Road
Fort Benton
To Great Falls
Clear Lake Road
Twin Lakes Road
White Rocks Road
Sheep Coulee Road
Buffie View Road
Hopp Road
Cow Island Road
Eagleton Road
Judith Landing Road
Eight Mile Bend Road
Hole in the Wall
Graceville Road
Flat Creek Road
Panton Road
Geraldine
Square Butte
Missouri River
CHOUTEAU COUNTY
FERGUS COUNTY
Arrow Creek
Everson Bench Road
HIGHWOOD MOUNTAINS
SQUARE BUTTE WSA
To Stanford/Lewistown

UPPER MISSOURI RIVER BREAKS NATIONAL MONUMENT

East Half Transportation Map

Map 5 - Alternative F (Preferred) - Side B
Proposed RMP/Final EIS



Legend

- Wild & Scenic River Boundary
- Area of Critical Environmental Concern
- Wilderness Study Area
- County Boundary

Surface Ownership

- National Monument (BLM)
- Other BLM
- Indian Land or Reservation
- U.S. Fish and Wildlife Service
- State
- Private

The BLM has no jurisdiction over private or state land and minerals, and these lands and minerals are not part of the Monument. Landowner permission is required for access to private property.

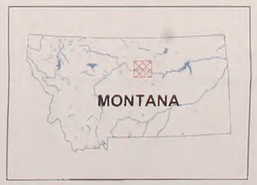
- County Roads, Highways, and CMR National Wildlife Refuge Roads or Other Main Public Roads
- Open State Land Roads
- Closed State Land Roads
- Backcountry Airstrips

BLM Road System

- Open BLM Roads
- Closed BLM Roads
- Limited BLM Roads
- *Landowner Permission may be Required for Access to BLM Roads

Limited BLM Road Designations

- Open April 1 to November 30 (Closed December 1 to March 31 - Big Game Winter Range)
- Open December 1 to August 31 (Closed September 1 to November 30 - Wildlife Habitat Security: Game Retrieval Allowed from 10:00 a.m. to 2:00 p.m.)
- Open April 1 to August 31 (Closed September 1 to November 30 - Wildlife Habitat Security: Game Retrieval Allowed from 10:00 a.m. to 2:00 p.m. and Closed December 1 to March 31 - Big Game Winter Range)
- Open September 1 to November 30 - Access for Hunting Opportunities: (Closed December 1 to August 31)



Disclaimer

Base data derived from USGS digital and mylar 1:100,000 scale maps. No warranty is made by the Bureau of Land Management (BLM) for use of the data for purposes not intended by BLM.

Generated by the Lewistown Field Office - January 2008.

The map projection is in Albers; the data is in NAD 27; and the units are in meters.

N W E S

0 0.5 1 2 3 4 Miles